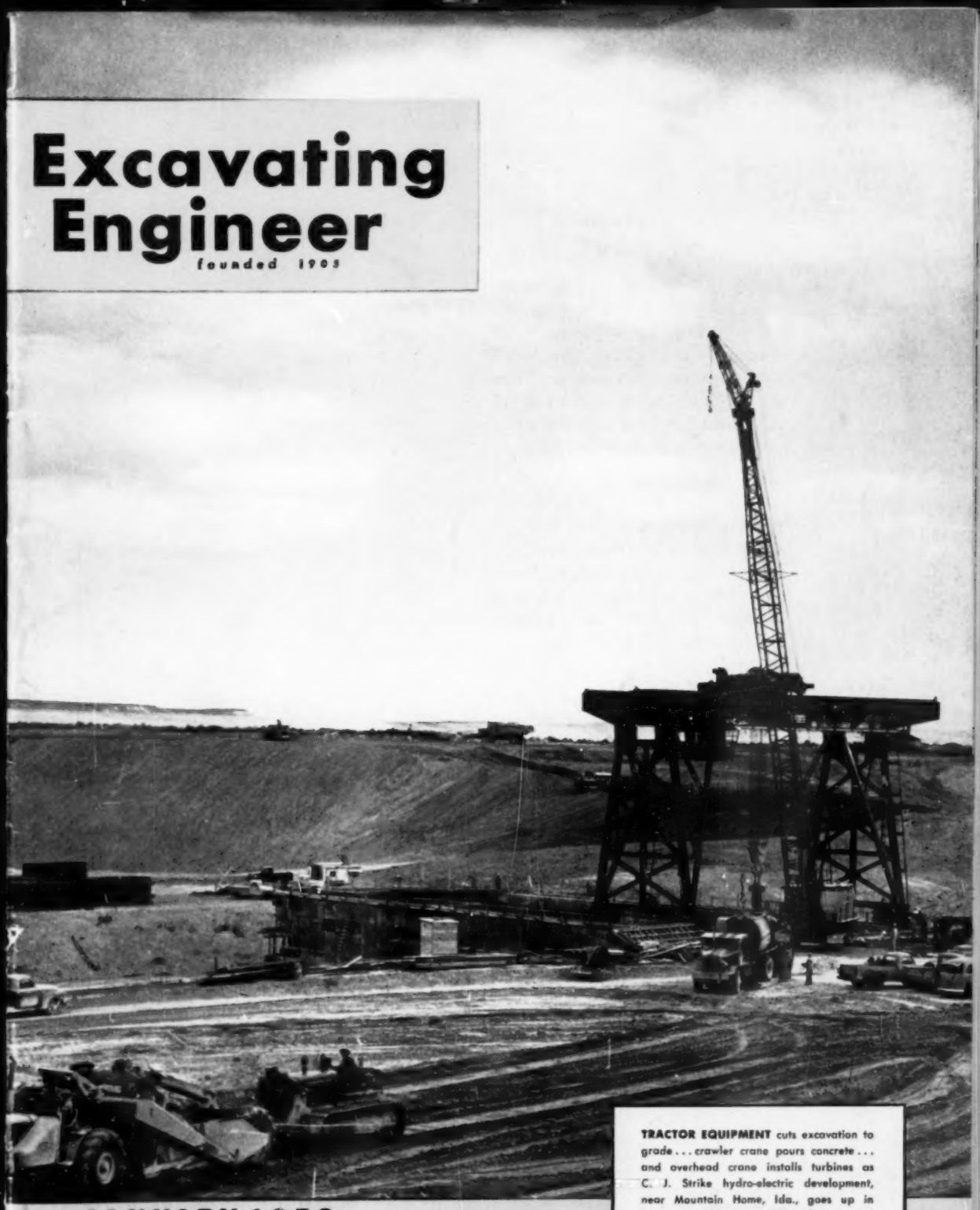
Excavating Engineer

founded 1905



TRACTOR EQUIPMENT cuts excavation to grade . . . crawler crane pours concrete . . . and overhead crane installs turbines as C. J. Strike hydro-electric development, near Mountain Home, Ida., goes up in fast time. Thirteen months after ground breaking, power was fed to lines. See story beginning on page 14.

JANUARY, 1952

HYDROHOE Cuts Trenching Move-Up Time by 40%

With the smooth extend-retract action of its telescoping boom, the fully hydraulic Bucyrus-Erie Hydrohoe cuts move-up time on trenching as much as 40 percent. Operator begins cut with boom extended to full "out" position. As he trenches he retracts boom, digging right up to the back of truck. This dragshovel earns extra dollars digging, while conventional units are moving up.

After digging a length of trench, operator can peel off the last few inches at grade level — smooth out the scallops, by merely telescoping boom. In addition, ability to retract boom makes the Hydrohoe extra compact for work in close quarters.

These are only a few of the many Hydrohoe advantages. For complete details write us or see your Bucyrus-Erie Hydrocrane distributor. He will be happy to arrange a demonstration. 132H51C

The new Bucyrus-Erie Hydrohoe gives you not one, but two digging actions: 1. Conventional dragshovel digging arc. 2. A separate horizontal action by means of telescoping the boom.

By actual measurement this Hydrohoe, digging at an approximate depth of 4 ft., cuts an 11-ft. long trench — without a single move-up.

BUCYRUS ERIE HYDROCRANE

• From Hydrohoe to Hydrocrane—right in the field—only three hours. This quick convertibility increases the on-the-spot value of the Hydrocrane's many attachments—hydraulically operated clamshell bucket, ⅜-yd. materials handling bucket, 1-yd. snow and trash bucket, catch basin bucket, grapple, magnet and cranehook.

BUCYRUS-ERIE HYDROCRANE DIVISION

South Milwaukee, Wisconsin

Crawler trencher digs 4′ ditch 7½′ deep with help of 68 TIMKEN® bearings

THIS Model 320 is reported to be the only crawler type trencher that can dig a 4′ ditch 7½′ deep at the rate of 10 to 12 lineal feet per minute. To keep its many moving parts operating, with minimum maintenance and time-out on the job, Cleveland Trencher Company uses a total of 68 Timken® bearings in the differential, transmissions and track rollers.

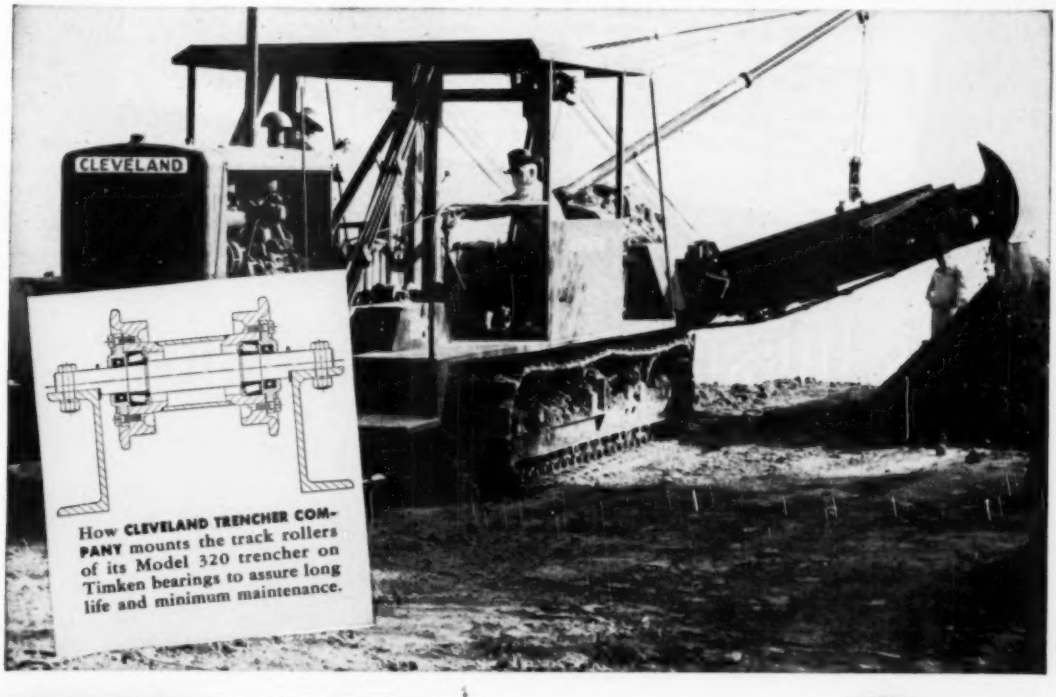
Timken tapered roller bearings take radial and thrust loads in any combination, hold shafts in rigid, positive alignment. Proper gear meshing and a smooth flow of power is assured.

Because they keep housing and shaft concentric, Timken bearings make closures more effective. Lubricant stays in, dirt stays out—reducing wear and maintenance.

Timken bearings provide extra load carrying capacity because of line contact between rollers and races. They normally last the life of the machine because they're engineered for the job, precision manufactured and made of special analysis Timken fine alloy steel.

No other bearing can give you all the advantages you get with Timken tapered roller bearings. Make sure you have them in the machines you buy, or the machines you build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



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The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

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TIMKEN

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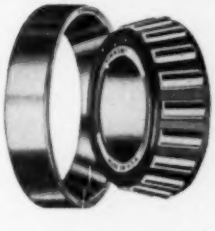

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Case History No. 5011-27

USER: Thomasville Stone and Lime Company, Thomasville, Pennsylvania

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PERFORMANCE: Replaced 5 small drills. Maximum footage with previous equipment 15 feet per drill in 6¼ hours; with new equipment 180 feet in 6¼ hours. Reduces drilling manpower. Fuel consumption: less than 7 gallons per hour (both engines).

This Diesel replaces five drills

— and more than doubles the footage

Case after case proves that any machine with General Motors Diesel power is a better machine—gets more work done at lower cost. Using General Motors 2-cycle design—this Diesel packs more power per pound, runs smoother and accelerates faster. Result—greater production per hour! With most parts interchangeable and easy to replace—GM Diesels take less time out for servicing, cost less to maintain. Check it with other operators—prove it for yourself by specifying GM Diesel power in any equipment you buy.

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Advertisers IN THIS ISSUE

Albert Pipe Supply Co., Inc. 40
American Chain & Cable Co., Hazard Wire Rope Div. 9
American Hoist & Derrick Co. 46, 50
American Manganese Steel Div., American Brake Shoe Co. 56
American Steel Dredge Co., Inc. 50
American Steel & Wire Div. 39

Bethlehem Steel Co. 6
Briggs & Stratton Corp. 52
Broderick & Bascom Rope Co. ....4th Cover
Bucyrus-Erie Co. .....2nd Cover, 7, 41, 54, 55, 63, 72
Buda Co., The 12

Caldwell and Co., Inc. 38
Caterpillar Tractor Co. 47
Columbia-Geneva Steel Div. 39

Detroit-Diesel Engine Div., General Motors Corp. 2
Drake-Williams-Mount 66

Easton Car & Construction Co. 13
Ensign-Bickford Co., The 51
Erie Steel Construction Co. 58
Euclid Road Machinery Co., The 33

For Sale (Classified) 71
Fort Dodge Tent & Awning Co. 62

General Motors Corp., Detroit Diesel Engine Div. 2

Hammermills, Inc. 65
Hayward Co., The 65
Hazard Wire Rope Div., American Chain & Cable Co. 9
Hercules Powder Co. 8
Hough Co., The Frank G. 59

International Harvester Co. 36, 37

Jaeger Machine Co., The 35

Koehring Co. 10, 11

LaCrosse Trailer Corp. 49
LaPlant-Choate Mfg. Co., Inc. ..3rd Cover
LeTourneau, R. G., Inc. 42, 43

Marion Power Shovel Co. 60, 61

Newman Mfg. Co. 53
Northwest Engineering Co. 5

Owen Bucket Co., The 45

Phoenix Products Co. 33

Rogers Bros. Corp. 67

Salem Tool Co., The 44
Sauerman Bros., Inc. 69
Schield Bantam Co. 68

Tennessee Coal & Iron Div. 39
Timken Roller Bearing Co., The 1

United States Steel Co. 39

Wellman Engineering Co., The 48

Excavating Engineer

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CONTENTS

Volume XLVI No. 1 **January, 1952**

Highball Kilowatts — by Ray Day 14
Starting from scratch, Morrison-Knudsen Co., Inc. throws a $20 million dam across Idaho's Snake River and puts power on lines in only 13 months.

Dozers Help Unload Ore Carriers 21

Falcon Dam — Part II: Construction Gets Under Way — by Edward F. London 22
Early stage excavation, opening of borrow and riprap pits, establishment of batching, mixing and aggregate cooling plants are now well under way at Falcon Dam site. Joint venturers formed two groups, one composed of United States personnel and one composed of Mexican personnel, to build their respective halves of the border-crossing dam. This is the second of two articles covering work on the project.

Mine and Line 2+ Mile Portland Sewer — by Art Wintle 30
Effective use of equipment lets Kuckenberg Construction Co. mine 100 and line 175 feet of 5½-ft. and 6-ft. barrel per day. Portland Sanitary District contract for $1.7 million covers 13,000 feet of tunneled sewer.

News from the Field 34

Rush Airfield Construction In North Africa 34
Pilot Car Leads Motorists Through Construction Area ..34
Michigan Iron Mine To Be Restored 34
First Bonds Redeemed By Maine Turnpike 34
Texas Flood Money Assigned to Projects 35
Mine Office Opens in Boston ...35
Flexible Plastic Pipe Aids Mining Operations 38
Turner Elected to Board Of NYC Association 38
Safety Drive Support Asked by AGC President 38
List 1951 Road Costs for Minnesota 40
Reveal Transport Costs for New England 40
Single Engine Speeds Dredge Output 40
Ky. Highway Department Urges Scrap Drive 44
Alaskan Engineers Issue Construction Outline 45
Western Road Test Planned 45
Nama Construction Engineer for Idaho Project 46
$300 Million Apportioned for State Highways 46
Wanamaker Resigns N. J. Turnpike Post 46
New Water Stop Used in El Salvador 48
Registration of Surveyors Sought in Wisconsin 49
Toll Trend Continues Spread ...50
Uncompleted Me. Airfield Becomes Naval Base 52

Obituaries
William P. McDonald 40
Raymond C. Force 50

Not in the Contract 57

Equipment You Ought to Know About 58

Ex-Laffs 64

New Trade Literature 65

Notes from the Manufacturers 68

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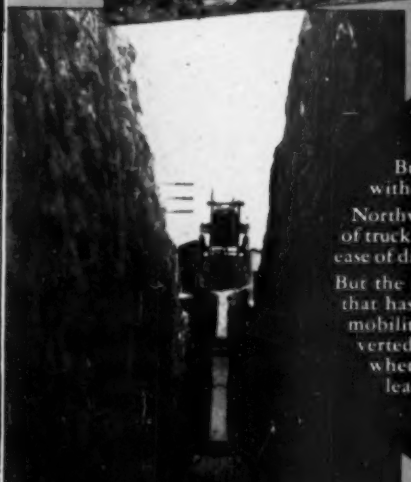
The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, The Advertising Council and



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XR52-1

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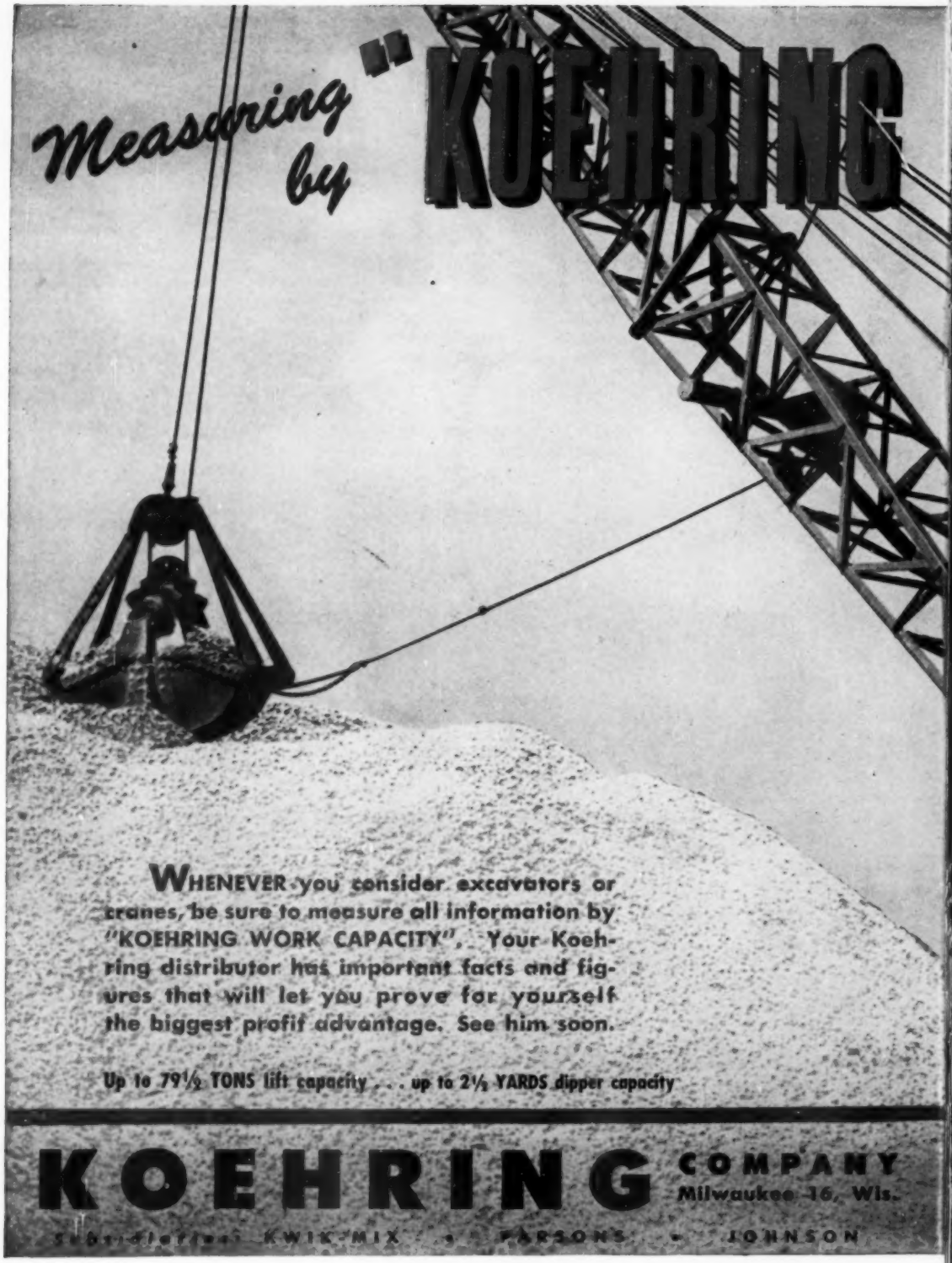
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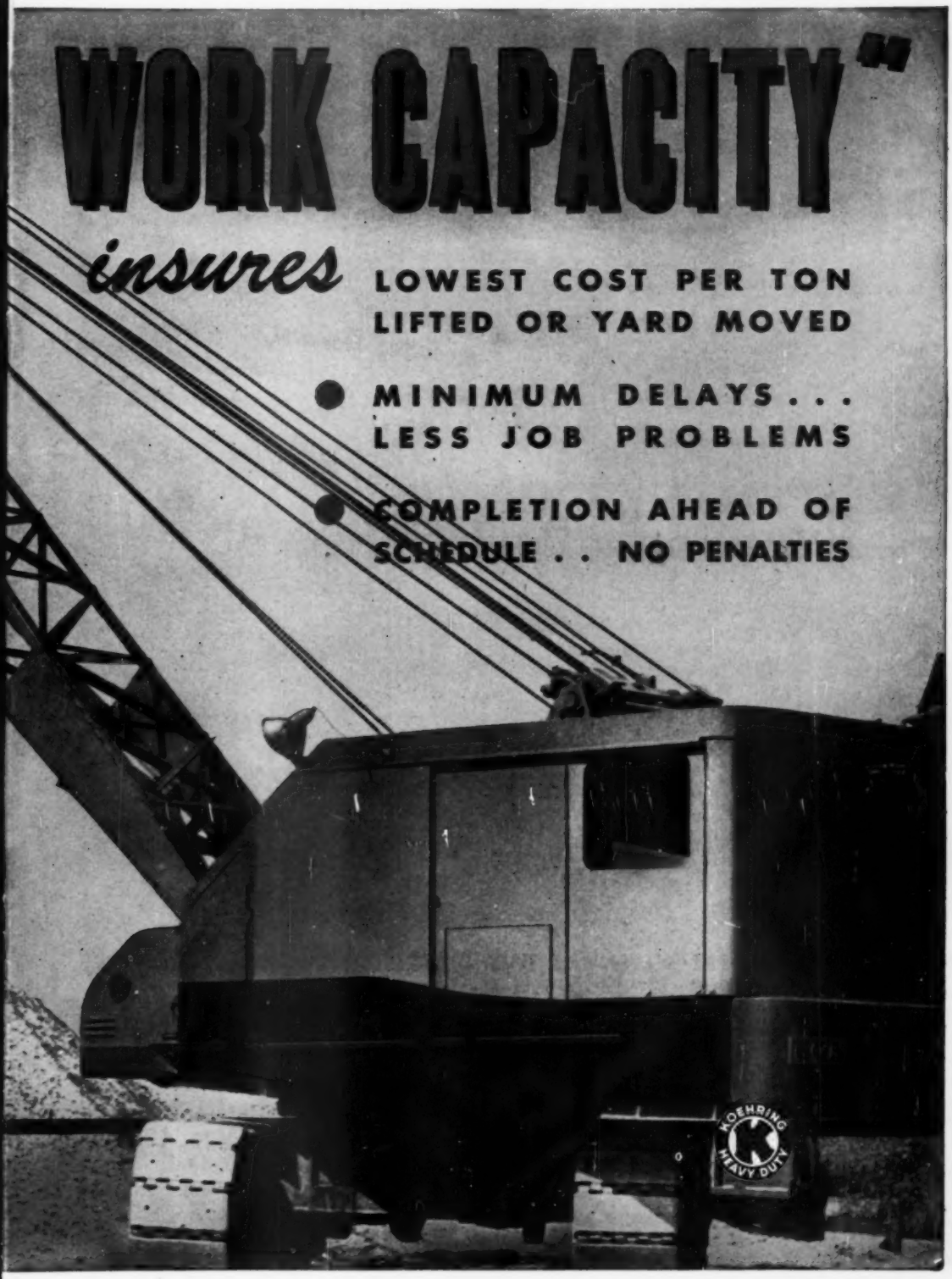
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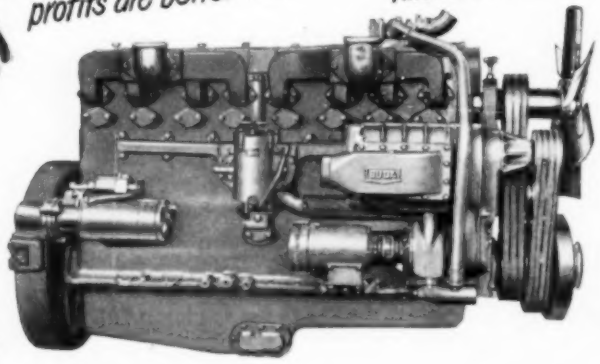

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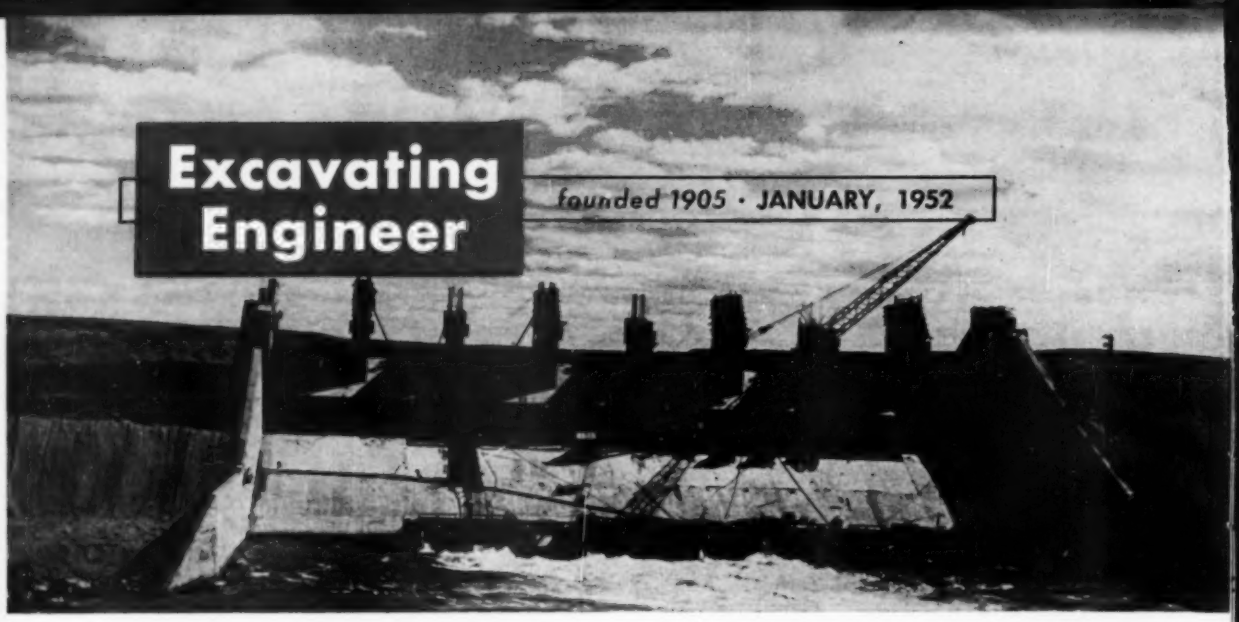


Highball Kilowatts

by Ray Day

Starting from scratch, Morrison-Knudsen Co., Inc. throws a $20 million dam across Idaho's Snake River and puts power on lines in only 13 months.

NOVEMBER 9th, 1950: Twenty miles southeast of Mountain Home, Ida., lava ridges above Snake River lay black and lifeless. At the site where engineers of Idaho Power Co. had planned to build C. J. Strike Hydroelectric Development, all was quiet. In Boise, only 60 miles away, officials were signing the contract for the $20 million project.

December 15, 1951:

Thirteen months after the go-ahead sign, an amazing change had been wrought. Much had been done. An access road eight miles long had been built. A campsite had been established. Batching equipment and total mobilization of a huge excavation fleet had been achieved. The spillway, powerhouse, and earth fill were finished. And Snake River flowed a subdued passage through the penstocks, turning the turbines which have added another 90,000 kilowatts to Idaho Power Company's vast system.

Credit for this fireball speed goes to the general contractor, Morrison-Knudsen Co., Inc. of Boise, to Ebasco Services, Inc. of New York, who designed the project, and to Boise officials of Idaho Power Co. who helped to expedite the monstrous job. Virtually all of the time M-K's field forces were working faster than Ebasco Services could rush the plans. At least 90% of the excavation was rushed through on preliminary plans alone. Mechanics worked out in the open during several

• Lower Left: A Caterpillar D8-mounted dozer stacks riprap for wave protection at C. J. Strike Dam. Below: Glenn C. Johnson, project manager at C. J. Strike Dam (seated) helps project engineer W. A. Abrahamson figure out structural problem.

• Left: Snake River flows through temporary diversion adits blocked out in the base of the spillway structure at C. J. Strike Dam. Later, the water will be diverted through the powerhouse and the temporary adits will be blocked with concrete.

winter months before a shop could be built to service equipment.

It was essential that all possible speed be made. In the post-war years since 1945 Idaho Power Co. has completed six new hydroelectric projects as a part of a $110 million expansion program to produce kilowatts for the increasing industrial and civilian demand in southern Idaho. C. J. Strike Dam, named for the late energetic president of Idaho Power Co., adds 90,000 more kilowatts to the generating capacity of the company's system.

The dam rests on a foundation of Hagerman clay which designers estimate to be 600 feet thick to bedrock. The structure is 3,274 feet long overall, and rises 132 feet high above the excavated Snake River bed. It consists of a powerhouse on the left abutment, a connecting earthfill dam, a 140,000 cfs spillway section, and a short earthfill connection between the spillway and right abutment.

Eight tainter gates 22x34 feet will control the spillway crest above the concrete ogee. Three identical turbines, fed by steel penstock 22.5 feet in diameter, take power from the Snake as water drops 88 feet from the penstock intake through the turbines to the tail race. The generators are General Electric Co. products, switch gear was made by Westinghouse, and the turbines were manufactured by Newport News Shipbuilding & Drydock Co.

One-Step River Diversion

Speed was so essential that Idaho Power Co. arranged to rush all permanent equipment to the job as fast as construction forces could use it. It helped enormously to speed the job, because Idaho Power Co. had for some time been working on specifications and orders for this machinery. The 150-ton Bedford overhead crane, for example, arrived and was erected in plenty of time to set up the generating equipment.

The earthfill portion consists of a clay core with random buffer zones above and below the center line of the dam. Dumped riprap protects the upstream slope from waves.

River diversion was made in only one step, since the spillway and powerhouse sections lay on either side of the natural stream channel well in the dry. The spillway, powerhouse, and portions of the earth embankment which lay on dry ground were built first, leaving the river to flow in its natural channel.

While these structures were being pushed, a Bucyrus Erie 54-B and a Manitowoc 4500 dragline combined to dig a curving artificial channel to train

• Above: Silhouetted against the Idaho sky, this Southwest sheepsfoot roller is delivering compaction to the clay core of C. J. Strike Dam. Below: After an early period of excavation, this Bucyrus-Erie 54-B machine doubled as a heavy-duty crane, placing concrete for the powerhouse and spillway structures.

• This aerial photo shows the M-K camp and office in foreground, the dam and power plant under construction at left and the repair shop and carpenter headquarters directly across Snake River from the service bridge.

the river to the spillway. Protective plugs were left upstream and downstream. Ten sluiceways 10x15 feet in size were formed at the base of the spillway at river grade to carry the water during the diversion. When the time came to make the river change, the Manitowoc and Bucyrus-Erie machines simply cut the upstream and downstream plugs, and the erection of earth cofferdams across the natural channel completed the change. Later, the sluiceways were plugged at both ends with concrete.

A Big Dirt Job

From start to finish, the prime work item was dirt. Access to the project depended first of all on completion of the 8-mile access road. Concrete work couldn't start until the excavations had been made for the spillway and powerhouse. River diversion depended upon completion of the earthfill portion of the dam connecting the structures. Finally, the early generation of power depended on bringing the earthfill up rapidly beyond the elevation of the spillway crest.

When Idaho Power Co. officials told Morrison-Knudsen "The job is yours" November 9, a total of 2,535,000 yards of excavation and 1,600,000 yards of fill lay ahead. The quantities were not too concentrated, either. Excavation consisted of 165,000 yards in the north abutment, 1,300,000 yards in the spillway, 220,000 yards in the intake, 70,000 yards in the south abutment, and another 800,000 yards in the powerhouse and tailrace. Some 454,000 yards of impervious clay core material was planned for the embankment, and over 1,000,000 yards remained for the random zones.

Shovels, draglines, scrapers, rubber-tired hauling vehicles, motor graders and processing equipment moved quickly to the job. Working as a dragline with a 5½-yd. Esco bucket, the Manitowoc machine started excavation in the spillway. Because the powerhouse section contained a pocket of impervious core material which was relatively light in weight, M-K dirt men rigged the 54-B with an Esco medium weight outsize 4-yd. dipper and a 4-yd. dipper stick. The scheme worked, and the 54-B stood up even though it was overloaded by 1½ yds. per swing.

Two Northwest 80-D's and a Model 6 also worked as shovels, equipped with Esco 2½-yd. dippers. A Northwest 95 dragline with 70 feet of boom and a 3-yd. bucket completed the shovel-dragline equipment. A Lorain Moto Crane was sent to the project to be used mostly for craning forms, moving machinery and equipment, and handling supplies.

Fast rubber-tired hauling equipment included five 17-yd. Wooldridge Terra Cobras, three 17-yd. Euclid end dumps used primarily for riprap, three 25-yd. Euclid belly dumps used under the outsize 54-B, three 17 yd. Euclid belly dumps built up from conventional 13-yd. machines. One International TD-24 with Bucyrus-Erie power control unit and cable controlled push block was assigned to help load the Terra Cobras. The scraper fleet consisted of eight Caterpillar D8's with 17-yd. Wooldridge hauling units.

Processing equipment consisted of two D8-mounted dozers for spreading material, a Euclid-mounted 4,600-gallon water sprinkling tank, a 50-ton Bros pneumatic roller for random material, three sets of Southwest tandem

• Draglines dig out the protective cofferdam below the spillway after that structure was finished.

sheepsfoot rollers ballasted to 1,200 pounds psi and two No. 12 Caterpillar motor graders.

Excavation lined out immediately on a double 10-hour shift basis six days a week, and the first problems soon showed up as the clay foundations for the spillway and powerhouse were exposed. The entire area is a part of the ancient Hagerman Lake bed which, in prehistoric times, extended over southern Idaho and well into Oregon. Varied deposits were found, some porous enough to let ground water seep in to the powerhouse and spillway excavations. It made the Hagerman clay as slick as grease.

Deep drainage trenches were cut by dragline along the outer perimeter of these structures, sloping the bottom to corner sumps where the infiltrating water could be removed. A 10-in. gas-driven Rex pump, two 6-in. Gorman Rupps and numerous 3-in. Jaeger and Rex pumps worked in the sumps to remove the water and keep the areas dry. By keeping the trenches deep and sloped well ahead of excavation, the two major structures were uncovered to foundation with no further mishaps. Fortunately, the run-off during flood period was below normal.

Careful Compaction Required

A clay core wall and a few short sections of steel sheetpile cutoff were built under the earthfill dam proper. Construction of the dry-land portion of the earthfill started almost as soon as machines began to open up the spillway and powerhouse. Clay was used direct from excavation to fill, where possible. About 300,000 yards of random material from the spillway was stockpiled for use later, and the remainder of this material was taken from an area 3,500 feet from the site.

Approximately 90% of the structure excavation was staked and dug from preliminary plans. Hard-pressed designers of Ebasco Services in New York worked frantically to get detailed sheets out for the spillway and powerhouse, but the highball dirt outfit moved so fast that it was usually ahead of the arrival of plans. Rain or shine, good weather and bad, day and night, M-K's crews plugged away.

Extremely careful compaction is necessary in all embankment sections, because the dam when completed will have to retain a reservoir about 100 feet deep for years to come. Special care is being taken with the impervious core, placing the material in the dam at densities greater than that found naturally in the formation.

The Hagerman clay is really a silty material, fine and light. It is found in deep deposits very close to its optimum moisture content of 23%. Its ordinary dry unit weight in place is 88 pounds pcf, and this density is being increased to 95 pounds plus after compaction in the fill. A tan clay is also found. It is a different material from the Hagerman formation.

Impervious material was hauled entirely by the Wooldridge Terra Cobras, which dumped it on the fill sufficiently thick to make a 6-in. course. After being spread by a motor grader or dozer, about 12 passes were made by sheepsfoot rollers to develop the desired weight. If the weather was dry and windy, it was often necessary to process this soil with a Rome 2-way disk, adding a light sprinkle of water, prior to sheepsfooting it down.

The random-zone material is also

• Above: An International TD-24 tractor equipped with pusher and Bucyrus-Erie power control unit push loads a Wooldridge Terra Cobra in random zone borrow pit.

• Left: Gilbert H. Wilson of the soil-testing firm of Greer & McClelland samples a core of soil taken from embankment to get wet weight.

• Below: Looking across the powerhouse area we see carpenters erecting concrete forms in foreground as equipment pours in yardage behind.

found nearby, in segregated pockets well graded by water and waves of ancient times. It consists of a uniform gradation of sandy-gravelly material below three inches in size. As a rule there was no cementation, and the material dug easily. Assisted by the TD-24 pusher, the Terra Cobras were able to take heaping loads out of the pit almost every trip.

Water was pumped from the river to the random-zone pits, so that this material would have its water content when it arrived at the fill. Even where the material was loaded by one of the Northwest 80-D's, a man with a hose sprinkled water over the bank at the dipper. When the random material was dumped and spread on the fill, a large 50-ton Bros pneumatic roller quickly mashed it down to high density. Better results were possible with the pneumatic machine on random material than the sheepsfoot rollers would deliver, and conversely, sheepsfoot rollers worked much better on the impervious clay core material.

Large yardage performances were turned in at once. The month of January, 1951 saw 483,000 yards of excavation dug, and in September 442,000 yards of fill went into the embankment.

Get Riprap Nearby

Both random zones, the clay core, and the rock riprap protection on the upstream toe at wave line are being placed simultaneously. The riprap came from a natural deposit about 2,000 feet upstream. It was dug in 16-ft. lifts by a Northwest 80-D shovel and a 2½-yd. Esco dipper, loaded to three Euclid end-dump hauling units, and brought to the fill. The trucks dumped near the edge, and the coarser boulders were shoved to the outside by a D8-mounted Caterpillar bulldozer.

When the Snake River diversion was made from the main channel, equipment operators found a 12-in. layer of freshwater mussels which soon decomposed under the hot sun and gave them something they will long remember. The stench was unbearable, and while the operators grumbled and bulled it through, the camp cook teased everybody about the money he was saving on meal costs. Everybody for miles around was happy when the last of the shells had been removed.

Included in the powerhouse and spillway structures are 256,000 yards of concrete, some of which embodies an

unusual design. The spillway, for example, is being built like a tooth: the inner pulp section calls for a very lean 1,000-pound compressive strength concrete to give weight and bulk, while the capping or enamel is high-strength 3,000 to 4,500 pound rich concrete. There was no artificial cooling, and with the exception of a small amount of Protex air-entraining agent, no special additives are being used in the concrete mix.

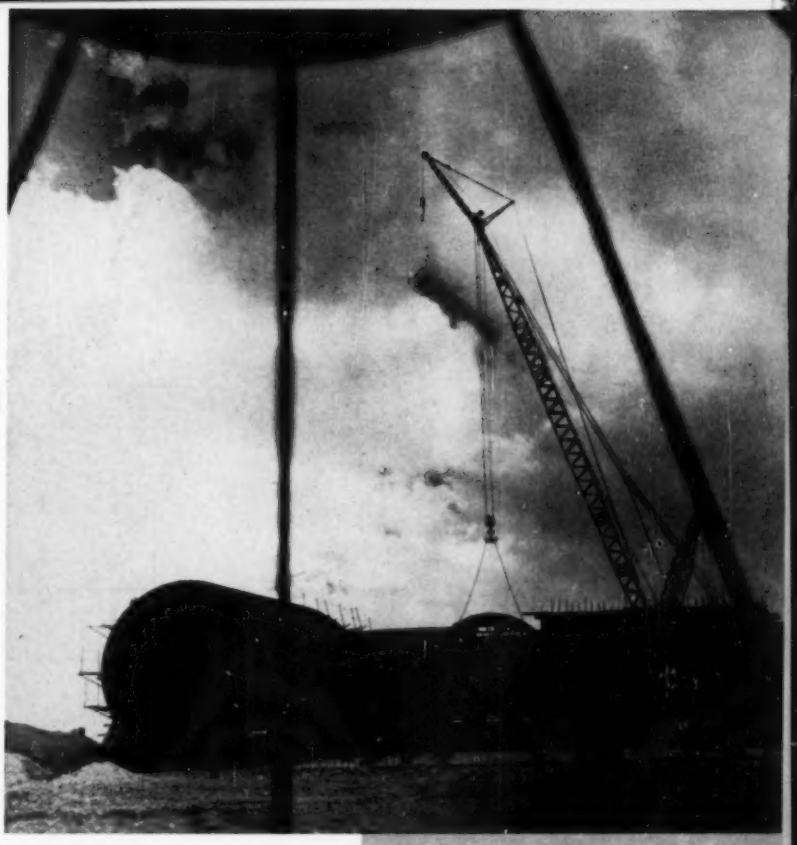
Forms are all being made up of wood. A carpenter area on the left bank of the river below the dam has power saws, layout jigs and other paraphernalia to develop the intricate forms. Vertical concrete sides are formed by wood panels, usually of the form-tie variety, and a few cantilever wooden forms are also used. Draft tubes and some of the other special curved forms are tough to build, so carpenters work sometimes months ahead of the actual need for these forms to get them built and checked. All forms, whether they are panels or special curves, are hauled out to the pouring site by truck and installed by one of the cranes on the project. The 54-B Bucyrus-Erie machine handles forms a considerable part of the time.

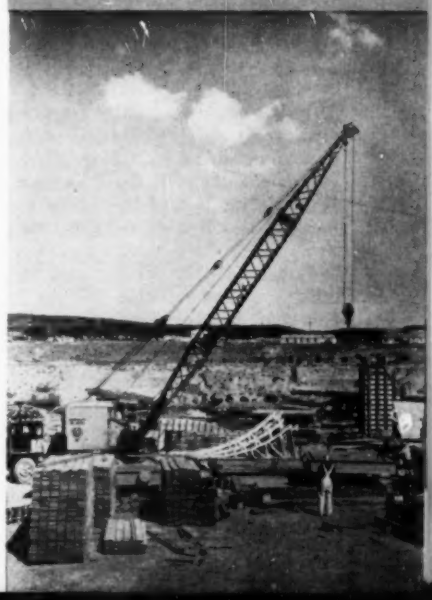
The concrete placing phase calls for a scheduled maximum of 150 yards an hour. Ample plant capacity to hit and maintain this peak is provided by two Noble semi-automatic batchers, each of 100-yard-an-hour capacity. These plants are hooked in tandem to deliver batches quickly to the mixers. Concrete materials are being produced nearby and hauled to the site. The speed of this year's construction completed scheduled concrete work before freezing weather set in.

One of the unusual things about the concrete plant is a new and novel way of opening sacked cement at high speed. The Joe McGee device which several M-K batch plant employees dreamed up also saves money over the hand method of opening cement bags.

Sacks are loaded by hand onto a conveyor belt at 8-ft. intervals. This conveyor then carries the bags across two circular saws, which rips 23 bags per minute. A vibrating chain, whose original use was in a mechanical potato picker, then shakes the ripped bags to empty the cement. It drops into a hopper which feeds the two Noble plants. The empty sacks pass by conveyor to a disposal incinerator, where they are burned.

Transit-mixed concrete is being used exclusively. The dry batches from the twin plants drop to 8 Rex truck mixers mounted on Euclid hauling units. Two more Rex mixers on White trucks complete the mobile concrete fleet. By the time the transit mixers get from the plant out to the point of placement, the concrete is ready to be dumped to Gar-Bro placing buckets and swung by the Bucyrus-Erie 54-B, the Manitowoc and Northwest 95 cranes to position over the pour. Viber electric vibrators, rated at 3,600 impulses per minute, consolidate the material. The concrete is placed in 10-foot lifts on mass pours; slightly higher on thinner walls. After a 7-day water curing period, the forms are ready for removal and the concrete is ready for service.





• Above: A Manitowoc crane erects steel on the three giant penstocks which will carry Snake River through the powerhouse. Part of the steadying "spiders" in the middle penstock frame this picture. Below: This Lorain Motocrane was used on a variety of jobs around the project. It is moving some of the heavy gate pieces here.

Equipment Upkeep is Good

In some of the bitterest weather last winter, mechanics at C. J. Strike worked outdoors to service machinery as carefully as if it had been a mild June day. The reason was dual. First, Morrison-Knudsen has always emphasized good upkeep of equipment, and this job was no exception. Second, while the equipment had to be serviced, there hadn't been time to build a shop. So

▼ A Koppin-Erie and a Northwest crane pool efforts to lift main girder of Bedford overhead crane into position. After assembly, the crane was used to install hydro-[illegible]

for the first few months the shop consisted of a cleared patch of ground along the north bank of the river.

That situation is now changed, and there is a heavy equipment repair-service headquarters area on the south bank of the river near the carpenter yard. A 75x130-ft. steel shop building lets major units of equipment come in for service out of the weather, especially when major repairs are made.

Dust and mud from the fine volcanic soil are major problems. The least little leak in an air cleaner on a dusty day shows up later on in expensive engine repair. Coupled with this has been a shortage of mechanics, and more often than not the mechanical force has been somewhat short handed. Four men on graveyard, six on swing, and seven on the day shift have done the complete repair and service job. The gang is familiar with ingenious methods for adding effective service time to the normal hours of a day, like moving the day shift ahead to 5 a.m. to take advantage of the 2-hour idle break in two 10-hour shifts of operation.

Mobile fuel, lubrication and tire-repair units are available. The tire repair truck has been particularly valuable for reducing down time when rubber-mounted hauling vehicles develop tire trouble. Spares are available, and when word comes in that one of the machines is down, the tire truck quickly roars out to the field with a spare aboard. The change is quickly made, and the tire can then be repaired at leisure in the shop. In the meantime, the equipment unit is again in operation with a minimum of down time.

Manufacturer's recommendations on all equipment are followed to the letter or better, especially when conditions are bad. There is a fair inventory of parts at hand. Spare items include tires, a Caterpillar power control unit, a Rex mixer engine, and a Buda engine.

Preventive hard facing is one of the major upkeep activities. M-K has standardized on P&H hard top bronze rod for sprockets and track pads at this project. Cast iron rod is used for hard-facing shovel dipper teeth and the exposed lip of all buckets, as well as on mixer paddles.

The result of the preventive maintenance program is plain for anyone to see. Drive into the project any day of the week, and there will be few, if any, pieces of equipment in the yard. Virtually everything will be out on the dam, in motion, working at top speed and efficiency.

Job Has Camp, Safety Program

Because Strike Dam is in such an isolated location, a 200-man camp had to be built to accommodate part of the 675-man gang which MK is using for its construction. The camp consists of bunkhouses and a main mess hall which will seat 220 men at once. Excellent food is provided, family style, and the mess hall also serves as a meeting place where foremen and superintendents can discuss day-to-day problems.

The fact that there have been no fatal accidents nor very many moderately-bad ones is a tribute to the safety program, which is administered by safety man Ed Maloney. One man fell about 15 feet to a bracing spider from the speed wheel of a turbine, but the damage was limited to four broken ribs, a fractured kneecap and a broken tooth. That was the worst accident of the project. Down in the carpenter shop a sliver flew all the way across the shop from one of the power machines, but it hit a man's hand instead of his head.

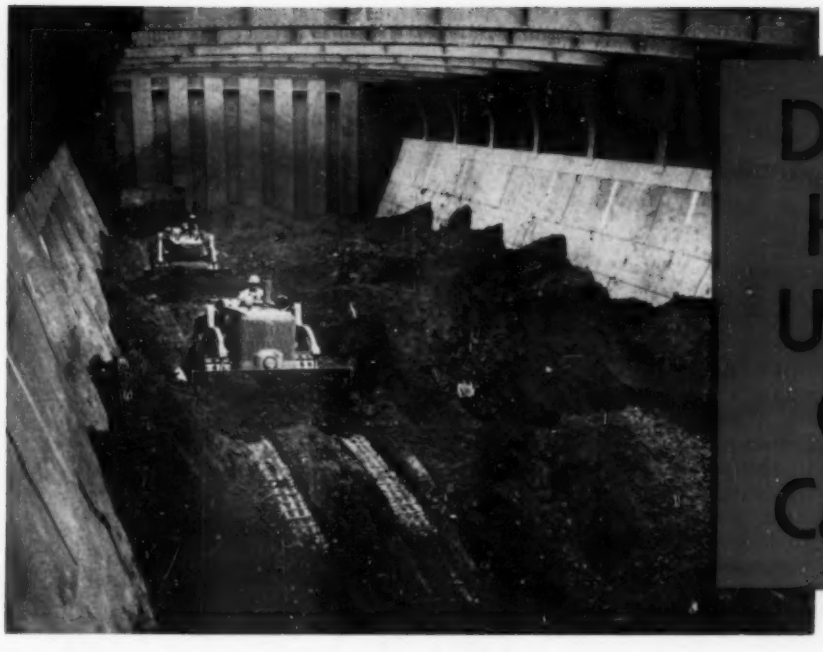
Maloney holds regular safety meetings, both in camp and out on the job. Accident prevention is ironclad, and Maloney has the backing of the project's top executives to get things done. Walkways are strongly built with proper guardrails, to start with. If a machinery guard is needed on a dangerous piece of equipment in the heavy repair shop, the thing is installed before someone gets hurt. A nice balance has been achieved between the expenditure of money for proper safeguards and the actual prevention of accidents and suffering.

Personnel

Glenn C. Johnson, project manager, heads up the field force of Morrison-Knudsen Co., Inc. D. C. Thomas is his assistant. Harry Woodall is excavation superintendent; Noah Barker and Lloyd Condit are general carpenter superintendents; Mark Johnson is erection superintendent; Roy Rasmussen is electrical superintendent, Jim Rutherford is in charge of concrete, and Sam Barta is master mechanic. W. A. Abrahamson is project engineer, and Roger Thomas is in charge of the carpenter shop. Lloyd G. Miller is office manager.

For Idaho Power Co., E. A. Woodhead, superintendent of power plants, is in charge of all operations. Fred McCormick is resident engineer for the company.

Completion of C. J. Strike hydroelectric development by the end of 1951 will mark the end of one of the fastest dam building jobs ever handled by a private contractor. For decades to come, mankind will benefit from the speedy work which has been done by the engineers, the contractors, and by Idaho Power Company's investment in Snake River kilowatts.



Dozers Help Unload Ore Carriers

THE unloading of ore cargo ships at the Wisconsin Steel Co. docks in Chicago has been further mechanized with the addition of two crawler tractors mounting bulldozers.

Laborers known as "scoopers" formerly shoveled both ore and limestone to the unloading rigs but these men have now been replaced by two operators who use International TD-14A crawler tractors equipped with Bucyrus-Erie bulldozers to do this work.

While company officials long recognized the savings that mechanization of this operation would bring, the final step could not be taken until this year when two Wellman clamshell rigs with buckets that take 12 ton loads replaced three smaller rigs. The small rigs could have dropped the crawlers into the holds by sling, but they didn't have the lifting height required to hoist the tractors from the empty boats, which rise in the water as the cargo is decreased.

Present procedure is to lower the crawlers into the hold after about half of the cargo has been removed by overhead unloaders. The two tractors feed the clamshells so that each load will measure a full 12 tons.

While the cargoes of the three ships serviced vary from 10,000 to 13,876 tons, company records show the average time for unloading ore runs between 9 and 10 hours while it takes 20 hours on the average to put a load of limestone into the stockpile. As the operators become more familiar with the crawlers, this average time is being reduced.

The stockpile at Wisconsin Steel Co. reaches peak capacity each November prior to close of navigation on the lakes when 590,000 tons of ore and 115,000 tons of limestone are accumulated for operation during winter months.

• An International TD-14A crawler with Bucyrus-Erie blade feeds ore to Wellman 12-ton clamshell.

• Loaded bucket emerges from hatch. Material is stockpiled for winter use when frozen lake prevents shipment.

• Unloaded hold shows how thoroughly dozer-clamshell team clears hold of ship. Tractors are lifted in and out.

Falcon Dam

Early stage excavation, opening of borrow and riprap pits, establishment of batching, mixing and aggregate cooling plants are now well under way at Falcon Dam site. Joint venturers formed two groups, one composed of United States personnel and one composed of Mexican personnel, to build their respective halves of the border-crossing dam. This is the second of two articles covering work on the project.

Part II: Construction Gets Under Way

by Edward F. London

ALONG the Rio Grande, a hard driving United States and Mexican force of approximately 1200 men is making the dirt fly under a joint venture of seven major United States contractors, which have been welded into a group called Falcon Dam Constructors, for the U. S. work, and Constructora Intercontinental, S.A. for the Mexican work.

Under the able supervision of General Superintendent Phil Royer and Executive Assistant Arthur Church and skilled construction men of both U. S. and Mexican origin, 12,300,000 yards of earth and rock fill, 420,000 yards of riprap, 261,000 yards of concrete, 11,300 tons of reinforcing steel and 6,200 tons of fabricated steel is being placed to form a major dam and reservoir, badly needed in the Rio Grande Valley.

Seven companies have pooled their resources under the leadership of F. W. Parrot, chairman of the operating committee, who is also president of C. F. Lytle Co., Sioux City, Iowa, one of the joint contractors. The other joint venturers are the following six companies: Amis Construction Co., Oklahoma City, Okla.; Edward Peterson Co., Omaha, Neb.; Foley Brothers, Inc; Massman Construction Co., Kansas City, Mo.; San Ore Construction Co., McPherson, Kan.; Tellepsen Construction Co., Houston, Tex. For agreement with the laws of Mexico, the same group of contractors have organized Constructora Intercontinental, S.A., under the laws of Mexican incorporation, which is handling the work on the Mexican side under Schedule No. 2.

The contracts call for the construction of an earth and rock fill dam, with a maximum height of 150 feet above present river bottom, and with a total length of 26,294 feet.

The earthen embankment will be constructed with compacted impervious earthfill core, protected and stabilized on both upstream and downstream slopes by a compacted sand and gravel fill. The upstream slope above a 20-ft. berm at elevation 225 will be further protected by a 3-ft. layer of rock riprap. The downstream slope will be stabilized with a rock fill. A cut-off trench is being excavated for the foundation of the dam embankment, varying from 20 to 150 feet in bottom width.

Test apparatus will be installed in the embankment to measure pressures, foundation settlement and embankment consolidation.

Clearing and Stripping

Although rough clearing had already been done under contract for the I.B.-W.C. before Falcon Constructors arrived on the job, about 500 acres at a depth of one foot had to be cleared and stripped of all vegetable matter. Four scrapers pulled by crawler tractors performed this work in the areas to be occupied by the dam and appurtenant works, and from the surface of all borrow pits.

Then, scraper stripping was concentrated on the dam foundation from the point of beginning on the American side to the spillway area. The scraper equipment was divided between the stripping for the cut-off trench in the dam foundation, and the stripping at the American borrow area, in order to get out ahead of potential excavation from the borrow area.

One hundred and fifty thousand yards of common material is being

• Above left: This airplane view of Falcon Dam site was snapped from U. S. side of Rio Grande. Part of embankment may be seen in foreground. Mexican embankment and excavation curves lie across river. Above right: Caterpillar crawlers with dozers place ballast rock on downstream side of Mexican embankment.

moved for the foundation of the dam embankment on the U. S. side by the tractor-scraper teams, which cut to rock or other suitable foundation and hauled to the spoil area just left of the spillway section, salvaging, of course, all material suitable for placement in embankment. Slopes of the cut-off trench are 1½:1, but accurate trimming was not required.

As soon as the stripping was out of the way on Schedule No. 1, a P&H 1055 electric dragline swinging a 5-yd. Yuan bucket, assisted by a Northwest 80-D shovel, moved into the Chapeno borrow area to excavate selected impervious material for the embankment. This was the first equipment on the job, but was soon followed by approximately $3 million worth of other equipment shipped by rail from the joint companies, and included much new equipment purchased for this job.

At the borrow areas the selected material consists of Zone 1 or impervious material and Zone 2 or selected pervious material. From parts of required excavation, Zone 3 or selected rock material and Zone 4 selected rock was obtained. It is hauled by Euclid bottom dump trucks ranging from 13-yd. to 24-yd. capacity for use in the dam foundation. Euclid end-dumps haul the larger rocks.

For the U. S. embankment which is within three feet of finished grade. over 1 million yards of common material was excavated and hauled to the dam from the Chapeno borrow area; 360,000 yards of Zone 2 material or sand and gravel fill is being placed; 96,000 yards of rock fill on the downstream slope is being placed; loading and placing 130,000 yards of riprap will be performed, at least in part from stockpile.

This part of the job moved forward without too much weather interruption. However, high wind swirled the dust and sand into thick clouds which kept Euclid operators on their toes as they passed each other at top speed, and, of course, continuous sprinkling of haul roads was thus necessitated.

A sprinkling system routed through 35,000 feet of 6-in and 8-in. pipe soaked the borrow areas for periods ranging from two to three weeks in advance of excavation. All excavated material was wet by wagon sprinklers on the dam, as needed.

After the Zone 1 material was placed, it was leveled by Caterpillar

• Left: Blast prepares approximately 5,000 cubic yards for excavation in Mexican tail-race. Ingersoll-Rand FM-2 wagon drills in foreground put down blast holes. Right: A Northwest 80-D shovel loads spoil to Euclid bottom-dump during night shift.

• Left: Air drill crews work at night on slopes of spillway, which is being excavated to a point within 10 inches and 2 feet of final grade.

D8 dozers and rolled by model 22 Gebhard sheepsfoot tamping rollers in 6-in. layers. To maintain the high compaction necessary, 12 passes were required by the rollers. Zone 2 material was compacted in 12-in. layers; the Zone 3 selected rock material was placed in 3-ft. thick horizontal layers; and Zone 4 material was placed in 24-in. horizontal layers. The rock is placed by the Euclids and then shoved into place by the tractors.

Start on Spillway

Backfill of the dam foundation in this section of the embankment was started at the deeper points for protection against possible floods. Just as soon as the foundation of the dam embankment on the U. S. side was completed, all the scraper equipment moved into the spillway section to be constructed under Schedule No. 1, and was followed by almost all of the other equipment, which had arrived by that time.

Excavation for the spillway is being performed under Schedule No. 1 and Schedule No. 2. The contractor under Schedule No. 1 is performing all excavation from sta. 16.08 to sta. 31.15 which includes the entire area where the concrete spillway structure is to be placed.

Under Schedule No. 2, the contractor is performing all spillway excavation from sta. 1.68 to sta. 1608; and from sta. 31.15 to sta. 78.80 at the left bank of the river. Where the spillway excavation is in areas to be covered by concrete structures, except excavation for spillway cut-off trenches, the rough excavation is carried to a point between 10 inches and two feet of the final lines of excavation, and will not be finished until the contractor is ready to place concrete. Spillway excavation for the areas to be covered by concrete is now being brought to final grade.

In this spillway section, unsuitable overburden amounting to 129,000 yards was removed to the spoil dump by scrapers making 350-ft. passes across the width of the spillway. It was used to build up the disposal area between the spillway and the river. The suitable material from this excavation is being used in the permanent construction required under both schedules of work. Materials excavated from the transverse to the spillway consist of sandstone and siltstone of different grades.

Sandstone Predominates

Here is a cross section of the materials encountered from elevation 250 down to elevation 50, in the spillway area, and is similar in the other structure and open-cut excavations:

Sand, silty.
Sandstone, badly weathered and soft.
Sandstone, moderately firm.
Sandstone, clay shale.
Limestone, sandy and moderately cemented fine to medium grain.
Siltstone, clayey, sandy firm.
Sandstone, firm.
Siltstone, clayey, sandy.
Sandstone, moderately firm.
Sandstone, fine grained.

Under Shift Superintendents Ed Davis and George Whittet, who alternate the day and night shifts of 10 hours each, excavating, drilling, and blasting operations are being done in several lifts on a sloping grade.

After a soft layer was removed by the scrapers, a Sullivan, model C-57, electric-drive shale saw, one Chicago Pneumatic G-200-R drill, one Worthington model FEED, one Cleveland, three Ingersoll-Rand FM-3's, four Ingersoll-Rand model FM-2 wagon drills, and three Joy 37 portable drills using a variety of rock bits moved into the area.

Much of the drilling is being done on the upper lifts at depths varying from 18 to 27 feet. The 2¾-in. drill holes are spaced from 5x5 to 13x15 feet, according to the depth of hole. Explosives are figured on a basis varying widely with relative density of rock encountered.

Because of the world situation and the possibility of stoppage of supply from a single source, Illinois, Dupont, and Atlas explosives are being used in rotation.

This soft rock drilling and blasting was first started with 30% special gelatin, detonated by Western-Electric caps, fired from a high-line at the edge of the cut. But, this has been increased to 50% gelatin to speed the shots, because too much line breakage resulted in huge boulders, apparently because of the slowness of the detonation.

The drillers are now having better luck by staggering the cap action with timed interval caps, by taking the in-

• Right: Euclid wagons spread fill on Mexican portion of embankment. This is near end of embankment and it is nearly up to desired grade.

• A Bucyrus-Erie 54-B dragline excavates sump hole in power house tail-race on American side of Falcon Dam.

stantaneous, the first delay, and third and fourth delay. With the faster acting powder they have been able to get satisfactory fragmentation resulting in very acceptable rock fill.

Some waste has resulted because the rock fill requirement is much less than the total rock excavation in the spillway.

Drilling day and night prepares enough material to keep the Northwest 80-D shovels and P&H 1055 shovels busy loading the bottom-dump Euclids for their fast trips to the disposal area and the dam embankment.

Drill Short of Grade

Drilling in the spillway is being done by the above method to within 8/10 feet above finished grade. In some cases, remaining rock in the shallow area, to avoid breakage below grade, will be shattered by a headache ball, swung by two Lorain MC-414 motor cranes.

The same methods mentioned above are being used to excavate, drill and blast the foundations for the U. S. Power System, Power House Intake Structure, and tail-race from the power house area to the river. All suitable materials from these excavations are being used for embankment fill on schedules No. 1 and No. 2.

Common excavation for the U. S. power house systems amounts to 320,000 yards; rock excavation in this cut totals 441,000 yards; with backfilling to be performed totaling 55,000 yards (estimated quantities). Fourteen feet of clay, encountered in drilling in the U. S. power house intake cut, slowed production for a while by stopping the bits. But the crew of Mexican nationals soon learned how to overcome this obstacle and made up the time when they got into the soft rock, where they averaged 90 feet per hour with the wagon drills.

One blasting shot observed by the writer was performed by using 1,550 pounds of Dupont 40% special gelatin, in 528 8-ft. holes, spaced 3x4, 5x7, and 13x15 feet, to move and shatter approximately 5,000 yards of fine grained sandstone.

Hand drills are being used to grade slopes in some portions of the spillway area from ¼:1 and 2:1 and trimmed with dozers and No. 12 Caterpillar motor patrols.

Much drilling of hard rock is in the offing at the quarry sites, where hard rock for riprap must be obtained. A large supply of the specified quality of rock for riprap exists 62 miles from the job site. However, the haul road to this rock supply on the Mexican side of the river is not in the best of shape for

• Above left: Tractor equipment excavates core trench. Water in cut came from first rain in about 18 months. Above right: Part of Falcon village is seen in this photo from the air.

the heavy loads required. Therefore, Phil Royer is having rock explorations made at El Jabali, 10 miles away, and at Los Mosquitos 22 miles from the job, on the Mexican side. Neither of these two points, however, contain the amount required for the entire embankment riprap, where specifications call for rock sizes varying from one cubic yard down to one cubic foot. Not more than 25% of the total can be smaller than one cubic foot, and at least 25% must be larger than one-half cubic yard.

Blast for Riprap

To get the 420,000 yards of riprap will require clearing and stripping as well as drilling and blasting. However, according to Art Church, the rock at the closer point is in such thin layers, proper fragmentation will be difficult. However, this does not hold true at the originally designated rock site. In order not to overshoot, experimentation on the conservative side will be made by using a fairly fast powder, and under-loading the holes. This will be a wagon drill operation.

A Koehring 605 shovel will be used for stripping at the nearest quarry, and is now being moved from the Mexican core trench excavation for this purpose.

When the principal rock supply has been established, a shovel will load the boulder-sized rock to LF-192 International Dual-Tandem dump trucks, six of which are now on the job, with 20 more on order.

When the spillway and stilling basin excavation has been completed, the Cannon Diamond Drill Co. of Compton, Calif., will move in under a subcontract to drill 51,400 feet of anchor bar holes, and perform the grouting and placing of the anchor bars. In this case, drilling will probably be done with percussion type drills, for 1⅛-in steel anchor bars.

While excavation for the structures is moving along without interruption and well within the schedule, Constructora Intercontinental under Schedule No. 2 is engaged on the Mexican portion of the work, moving and placing about five times the amount of material as that required for the U. S. side. To balance the cost, the U. S. will build the entire spillway structure and the embankment on the U. S. side, thus offsetting the larger amount of dirt work on the Mexican side.

One hundred per cent Mexican personnel is engaged on Schedule No. 2 items of work. The engineer in charge for Mexico is Oscar Gonzales Lugo and he is assisted by Carlos Molina Rodriguez, resident engineer. Phil Royer is pleased with the cooperation that he has received from the Mexican engineers in working out problems of mutual interest. They have assembled their own staff. A. H. Leal, liaison man between Phil Royer and the Mexican engineers, is also in charge of Mexican labor and equipment for the contractor.

Leal, a former U. S. earth moving contractor, is pleased as punch with his outfit which started from scratch in February, 1951 with much untrained personnel.

Under the same specifications as for Schedule No. 1, the Mexican embankment is now up to grade from a point near the Mexican field office at sta. 175 to the end of the dam on the Mexican side, a distance of approximately 1¼ miles. Leal says he is cutting down the long hauls first so that all equipment can be concentrated between sta. 175 and the river.

As soon as the core trench on the Mexican side is completed, and the equipment released from the rather narrow confines, there will be no physical limitations as far as the job is concerned.

Cut Out Core Trench

Borrow for Schedule No. 2 is being obtained from the Mexican borrow terrace situated about 1,000 feet upstream from the toe of the dam embankment, from which 6,360,000 yards of common material is being excavated by shovels and draglines, and placed on the dam embankment.

Before excavation began in this area, the stripping of 320,000 yards of overburden was required. This work was done with tractors and scrapers.

Six million six hundred thousand yards of Zone 1 material is to be excavated from the Mexican borrow area by shovels and hauled to the embankment for compaction. Hauls are over a mile long, averaging about 20 minutes per round trip.

Two and one-half million yards of common material in the Mexican core

• In the power house tail-race site on the Mexican side, a P & H 1055 shovel loads to a 10-yd. Euclid end dump. Rock has been shattered with explosive.

trench is being excavated by tractor-scraper units which are placing suitable material on the adjacent toe of the embankment at this point. Unsuitable material is being loaded by a P&H 1055 shovel with a 5-yd. dipper to the Euclids, which haul to designated disposal areas. The core trench at this point will be 50 feet wide at bottom, with slopes 1½:1 to original ground level. No blasting is necessary in this cut, but hard material is being scarified with a ripper.

Excavating production has been stimulated on the Mexican side by introducing a bonus system for all production and maintenance personnel. Two bulletin boards have been set up near the Mexican field office on which current production is posted including the following information:

Equipment No.
Shifts worked
Average haul per shift
Place

This system seems to find favor with the operators, and in addition to stimulating production, induces better handling of the equipment. If the equipment gets laid up for repairs, the operator loses his chance to participate in the cash bonus arrangement, which is given to the three top men in each group.

While the Mexican embankment is being built, excavation is proceeding in the cuts for the Mexican power systems, and that part of the spillway being performed under Schedule No. 2. Four shovels are loading common material and blasted rock to the trucks at the rate of about 825 yards an hour, for the four units working in 10-hour shifts. Common excavation for the spillway under Schedule No. 2 amounts to 2,587,000 yards and rock excavation in this area totals 1,301,000 yards. The same drilling and blasting methods previously outlined are in use here.

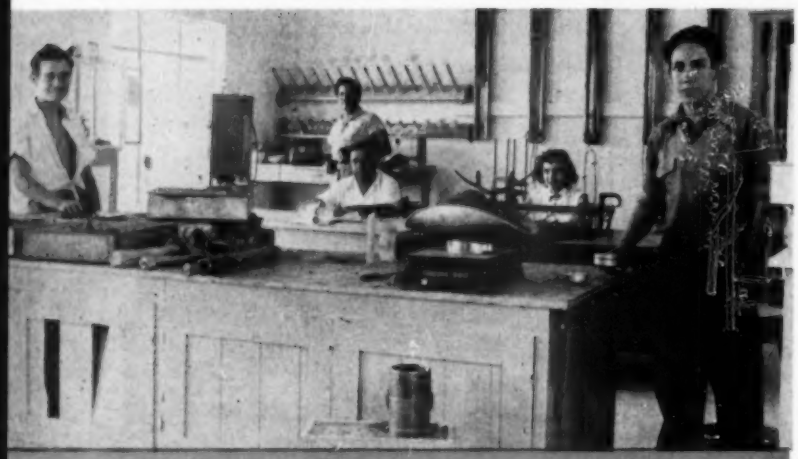
In the excavation for the Mexican power system, 310,000 yards of common material and 60,000 yards of rock are to be moved either to the embankment, if suitable, or wasted on the disposal area.

The Mexican excavation is being pushed round the clock (under lights at night) by Valente Zarate, day superintendent, and Carlos Bega, night superintendent, with the further assistance of Stanley Barrett, who is attached to both night and day shifts.

Plan Cofferdams

Scheduled for completion in 880 days, the upstream portion of the closure section of the dam is, according to Phil Royer, the most challenging part of this job. It is uncertain what de-watering problems will be met when the time arrives. A cofferdam will be built upstream at the narrowest point above the entry to the penstocks, and another cofferdam will be constructed at a point downstream at the left of the spillway. After the cofferdams are completed, the river flow will be diverted through the 22-ft. diameter penstock

• Extensive sprinkler system saturates borrow area for a period of two to three weeks before excavation.



• A staff of Mexican specialists mans this soil testing laboratory which evaluates materials encountered in handling Mexico's share of the dam construction.

of the Mexican power plant sometime late in 1952.

Put Down Toe Drains

Toe drains running the entire length of the embankment on the downstream side will be excavated with a backhoe, and approximately 9,440 feet of cemented and uncemented bell joint concrete pipe, varying in size from 6 inches to 24 inches will be imbedded in gravel.

While the excavating work is moving along in good shape, Mexican crews are operating a gravel plant on the Mexican side of the river and U. S. crews put up a C. S. Johnson batch plant on the river side of the spillway.

Sand and gravel for concrete and other uses is processed by a Pioneer gravel plant, model 1951. No other just like it, this plant was built to specifications and is now turning out gravel for the stock pile. It is operated by Mexican personnel under the direct supervision of Frank Wilson following its erection under R. A. Mauser, assisted by R. L. Pingrey, foreman.

A Cedar Rapids feeder belt conveyor system moves the gravel from the tunnel extending deep in the adjacent gravel pit. A Caterpillar D8 dozer and scraper piles gravel over the tunnel hopper.

The conveyor belt carries the aggregate to Pioneer vibratory screens, scrubber and dehydrator, and then into two compartmented bins and three separate bins.

Pumped from the river through 8-in. pipe connected to two 10-in. Jaeger pumps mounted on pontoons, 1,800,000 gallons of water every 10 hours will wash gravel at this plant.

At present writing, six LF-192 International trucks are hauling the gravel over the International Bridge to the stock pile located on the downstream side of the batch plant. Production will reach 1,000 yards per day when the concrete plant gets under way.

Assemble Batch Plant

Shipped knocked down from Whitney Dam on the Brazos River, near Whitney, Texas, the C. S. Johnson batch plant was re-assembled to furnish concrete for foundation and structure pouring which started about the 2nd of July, 1951.

A 340-ft. long by 36-in. wide Goodyear rubber belt conveyor, running from the tunnel under the stock pile and powered by a 30-hp General Electric motor, will carry aggregate to the top of the plant and to storage in eight bins of 400-yd. capacity. At the bottom of each bin is a weigh batcher, weighing material as it discharges to three Koehring 2-yd. tilt mixers, powered by 30-hp General Electric motors.

After mixing for 1½ minutes, aggregate is dumped into a wet-batch cone, in the bottom of which is a double-action clam gate. Then the air-entrained concrete spills into 2-yd. Johnson concrete buckets, mounted on 10 new Ford flat bottom trucks, for the haul to the pour area.

A crane with 125-ft. boom was used to erect the batch plant, which contains three silos: two cement and one pozzolan. The cement elevator is 94 feet high, powered by a 15-hp electric motor, and the pozzolan elevator is powered by a 10-hp motor.

A weigh batcher with air-entraining dispenser is adjacent to an 800-gal. cold water reservoir. Air for the batch plant is furnished by one Sullivan and one Ingersoll-Rand ES-1 electric compressors, housed just north of the batch plant. Just south of the compressor room is an ice making plant containing five Ingersoll-Rand ammonia compressors which will furnish 5,835 pounds of ice per hour, to be used with water as concrete mix in order to maintain temperature control. The plant is now busy building up a stock of ice.

One hundred and seventy-four thousand gallons of water every 24 hours will be pumped to the batch plant through 1,500 feet of 6-in. pipe connected to a couple of 6-in. Johnson deep-well pumps, located in a sump hole excavated by a 2½-yd. Bucyrus-Erie 54-B dragline, in the tail-race of the U. S. power system.

Capacity of this batch plant is rated at 144 yards of concrete per hour, and it will operate in two 10-hour shifts at peak production.

Six cranes—P&H, Lorain, Koehring and Bucyrus-Erie—will be used to lift concrete buckets from the trucks for pouring.

At the time of this writing, the batch plant personnel included 16 men headed by F. E. Sandy and Gus Larson, plant foremen. Warren Cowan is concrete engineer; Dick Wheaton, concrete warehouse foreman, assisted by F. M. Russell and Larry Dunning.

The Dallas Steel Reinforcing Co., Dallas, Texas, has a sub-contract to place all reinforcing steel in concrete structures.

Sprinkle Haul Roads

Maintenance of haul roads to the work areas is a full-time job for four 6,000-gal. Euclid water wagons and two converted Insley 4,000-gal. water wagons, used to lay the excessive dust as well as for furnishing water for dam compaction. Bulldozers and motor graders which are used to level material for compaction of the embankment, also serve to maintain haul roads.

All water for the sprinkling and the wetting of borrow areas is being pumped from the river by Johnson deep-well turbines. They also supply the 35,000-ft. sprinkling system at the borrow areas. A crew is assigned to gauge the penetration of this water and move the

sprinklers in accordance with the extent of moisture necessary for saturation.

Large maintenance shops are situated on both sides of the river for repairing and maintaining the vast assortment of equipment working on both schedules. Each of these shops employs about 50 men for repairing the equipment. Near the repair shops are fueling stations which dispense Gulf oil products. Because of the swirling sand, maintenance of the equipment is a major part of this job, and is under the competent supervision of Merle Orten.

Two way inter-communications radio connects the field office with supervisors who patrol the work along the 5-mile front. There are 13 of these sets installed in Chevrolet ½-ton and ¾-ton pickups.

Recently, Falcon Constructors closed a deal with Cia. Hulera Goodyear-Oxo, S.A., Mexico City, for setting up a recapping tire service for all rolling stock, except for the largest Euclid size. This is expected to result in a distinct saving for Falcon Constructors, as well as a hedge against a critical shortage of tires.

Material Hauled to Job

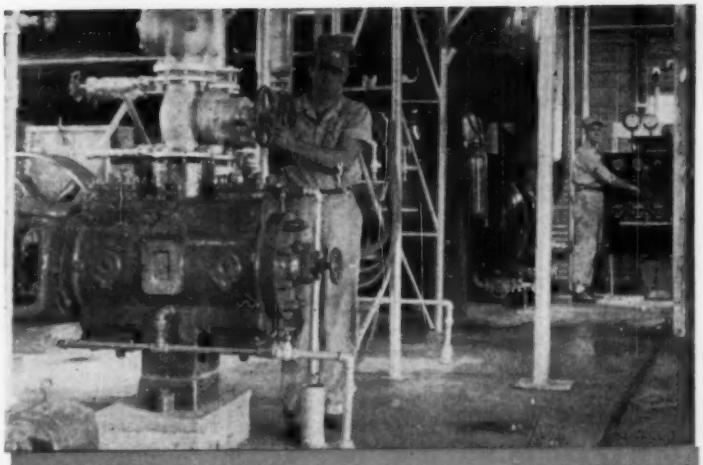
Bulk cement from the Halliburton Co. plant in Corpus Christi, Texas, for the Schedule No. 1 contract will be shipped by rail to Rio Grande City, and then by contractor trucks to the dam. Pre-fabricated reinforcing steel is shipped F.O.B. job from Houston and San Antonio by truck and rail.

Mexican cement and steel for Schedule No. 2 will be shipped from Monterrey, Mexico.

A first class village for official personnel on the U. S. side has been built about two miles from the job site.

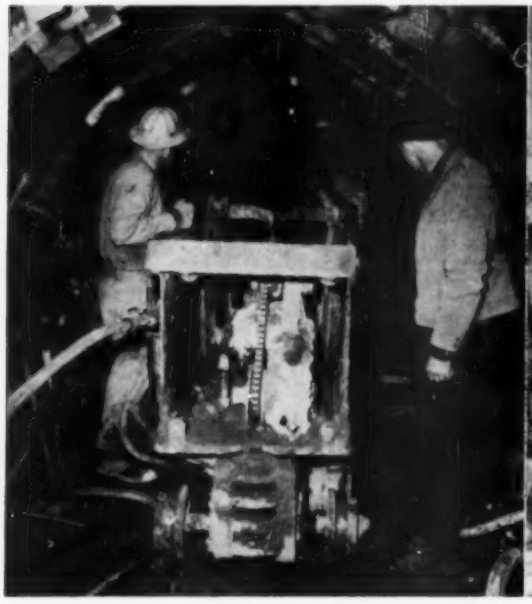
Personnel for Falcon Constructors includes:

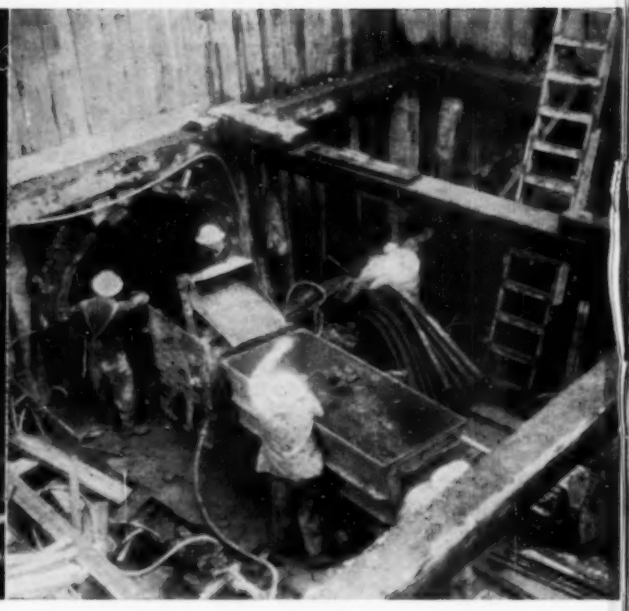
Phil Royer, general superintendent; Arthur Church, executive assistant to general superintendent; Perry Gardner, project engineer; Fred Kenny, office manager; Roy Thies, purchasing agent and assistant office manager; James Brodt, office engineer; H. C. Zachau, concrete superintendent; Ed Davis, shift superintendent, alternating with George Whittet, shift superintendent; F. E. Sandy, batch plant foreman, alternating with Gus Larson, batch plant foreman; Merle Orten, superintendent of equipment and shops; Frank Wilson, superintendent of gravel plant; Ed. Marx, electrical superintendent; A. H. Leal, superintendent of Schedule No. 2.



• Interior of batch plant showing one of ammonia compressors which help turn out over 5000 pounds of ice per hour.

• Above: Worthington 500 compressor powers this portable Joy drill, model 37, used in putting down blast holes in spillway area. Below: Carpenters construct forms for gallery underneath dam in shop on U. S. side.





Mine and Line 2 + Mile Portland Sewer

by Art Wintle

Effective use of equipment lets Kuckenberg Construction Co. mine 100 and line 175 feet of 5½-ft. and 6-ft. barrel per day. Portland Sanitary District $1.7 million contract covers 13,000 feet of tunneled sewer.

"WE HAD problems every day on this job," said Larry Kuckenberg, "but we are proud that they were licked and the contract is running four months ahead of schedule."

When the $1.7 million contract was awarded in November, 1950, the Kuckenberg firm immediately took advantage of low water tables to sink the first shaft on Portland's interceptor sewer which parallels the east side of the Willamette River along Grand avenue. This interceptor line is a vital link of an $18 million sewage project which completely overhauls parts and replaces sections of an older system which has long since been outgrown by the city.

When crews started work from the shafts they labored without mucking machines or electric trammers. This necessitated building small belt conveyors, driven by air motors, to load into cars which were pushed by hand to the shafts. Three such machines were built and used until the firm was able to secure six mucking machines and Mancha electric trammers.

Gardner Denver and Thor clay spades are used to loosen all material before the Sullivan Joy and Eimco mucking machines could dig and load into cars. Excavated material is then hauled to shafts, dumped and picked up again with Bucyrus-Erie and Northwest clamshells and loaded into trucks.

During the mining operation a 500 cu. ft. Chicago Pneumatic and 600 cu. ft. Ingersoll-Rand compressors are used at each shaft that takes care of two headings. There were three shifts at six headings working two shifts a day for six days each week.

"And there was plenty of water all of the time," remarked Lee Gordon, superintendent on the job.

In one of the shafts, three vertical contractor's pumps discharged thousands of gallons of water per minute. No shaft was without a pump of some sort in operation. Underground waterfalls continually came from the headings in some sections as crews dug on.

There was enough water for a prankster to transplant some 18-in. fish in a shaft and cause the foremen no little embarrassment when the fish were dumped from clamshells.

As crews continued across Asylum Slough, an old fill across a swamp under Oak and Stark streets, the water was no joking matter. There were old stumps, piling, bulkheads through which the heading crew advanced as little as one foot per shift.

The ground and swampy section was of a quicksand calibre, necessitat-

• For left: Superintendent Lee Gordon (right) looks over digging operations and a modified Eimco mucking machine. The mucking machines had to be especially adapted for this work due to size of tunnel headings. Middle left: Underground workers start vertical tunnel from base of open shaft. Left: A clamshell takes spoil at one of the shafts for loading into trucks.

ing the driving of weep pipes 10 to 15 feet ahead of the face. Even by taking maximum precautions, this 300 foot section settled from four to 14 inches. Steel distorted and timbers cracked. For a time there was considerable doubt as to how long the section would hold while a solution was being found.

To return the tunnel to proper location, a series of eight 50-ton jacks were used.

"We were surprised," Gordon said, "when we tried the jacks and they did hold. The section was repaired and we dug on!"

The intercepting line parallels, passes over, under and through the existing old system as it follows the course to a new treatment plant, now in partial operation. At the Sullivan Gulch end of the line, to the north, a pumping station will send the flow to an elevation of 125 feet, where it will continue to flow towards St. Johns by gravity, aided and controlled by pumping stations located at strategic positions.

Later two discharge pipes of 30-in. and 42-in. diameter will be sunk under the Willamette from the west side to connect with this intercepting artery.

The depth of the intercepting line, taken from street level to crown, varies from 30 to 60 feet. The average is near 40 feet. There are 16 shafts which are set 250 to 1,400 feet apart and range from 8 to 40 feet in diameter.

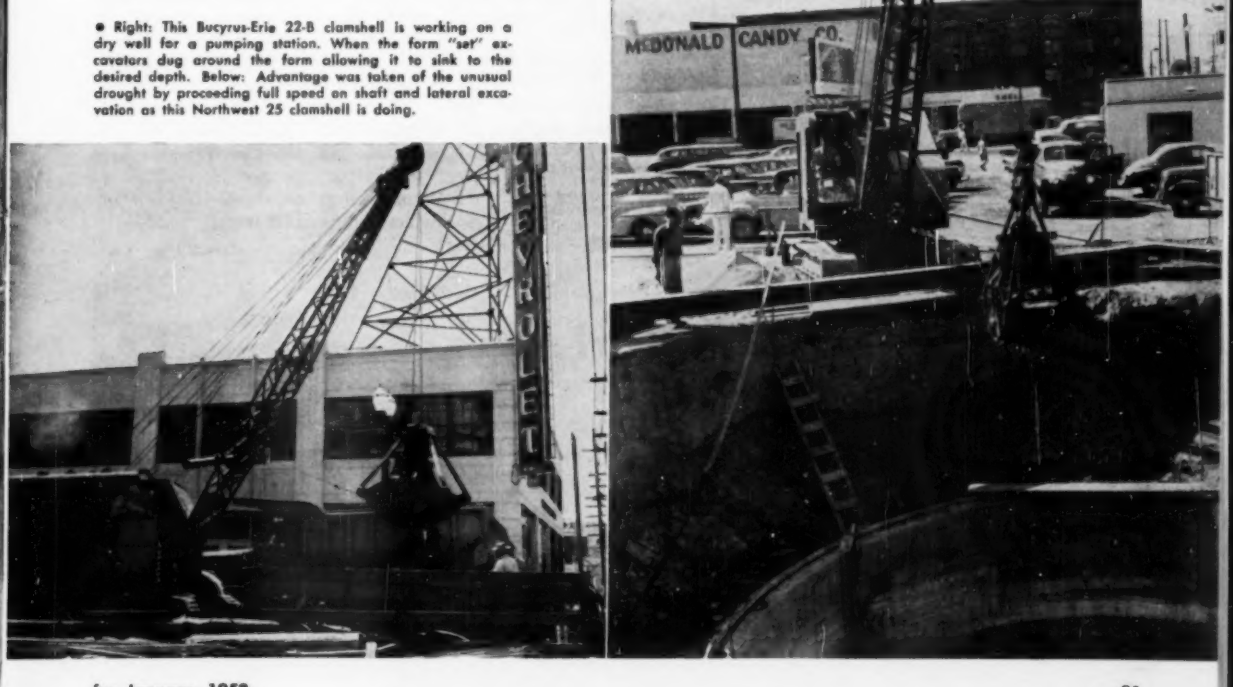
The Kuckenberg firm uses standard equipment and construction methods. They have taken advantage of their complete shops, however, to build additional aids to help solve their problems and stretch output of machinery in order that the contract with a heavy "time element" may be completed on time or ahead of schedule by four months as present construction may anticipate.

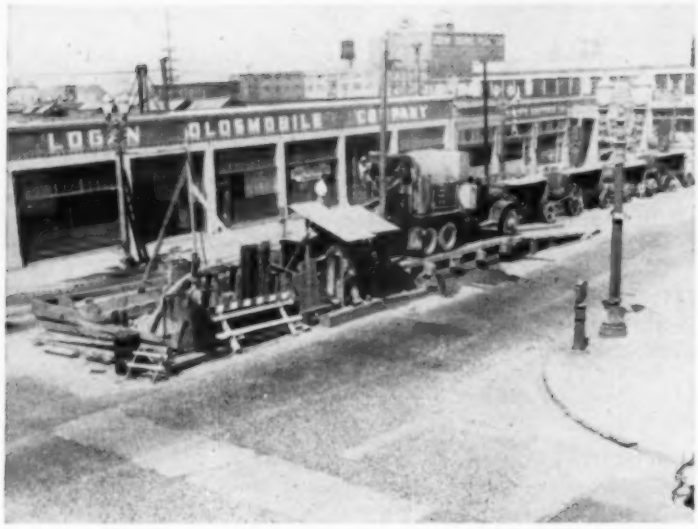
Speed Construction

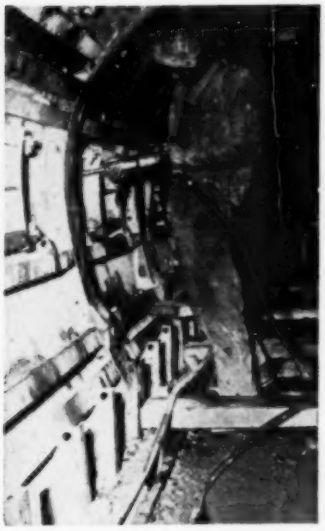
This was demonstrated in the mucking operations where the size of tunnel prevented the standard size mucking machines from operating properly because of the limited head room. So while waiting for the standard size Eimco and Sullivan Joy mucking machines to be remodeled, Kuckenberg shops constructed several air powered belt loaders designed specifically for operation in tight quarters. This gave the job an early start.

Six weeks later the remodeled Sullivan Joy and Eimco machines arrived and the burrowing went into full swing with the driven footage varying from 100 to 130 feet per day. Because of the location in the East Side business district, extreme care had to be taken when going through the softer ground

• Right: This Bucyrus-Erie 22-B clamshell is working on a dry well for a pumping station. When the form "set" excavators dug around the form allowing it to sink to the desired depth. Below: Advantage was taken of the unusual drought by proceeding full speed on shaft and lateral excavation as this Northwest 25 clamshell is doing.







• Left: Trucks bring ready mixed concrete to loading platform and discharge direct to shooting facilities of the Pressweld gun. In the background a series of compressors supply power for underground equipment. Above: After concrete is shot to forms, a pneumatic hammer is used to give it final vibration.

to assure a tight tunnel and prevent settlement of buildings, railroads, and public utilities.

About 5,000 feet of tunnel were excavated before concrete operations began. The firm used 4,000 steel ribs and over one million board feet of wooden lagging across the ribs to hold the shape of the tunnel in the interim between excavating and concreting. The obvert is poured far ahead of the invert which will be a final process in the completion of the sewer and removal of narrow gauge railway.

The day shift pours 175 feet a day, the swing shift removes the forms a like distance. A Pressweld ¾-yd. concrete gun, also modified in the shops to increase capacity, is used to shoot concrete to the forms under pressure. A compressed air tap then is used to vibrate concrete to a final set.

Lagging boards become the outside of the form. The inside is shaped with S. W. Welders tunnel forms, from plans of Noble & Co. of California. Mix trucks which drive upon a specially constructed ramp, deliver loads to the Pressweld gun.

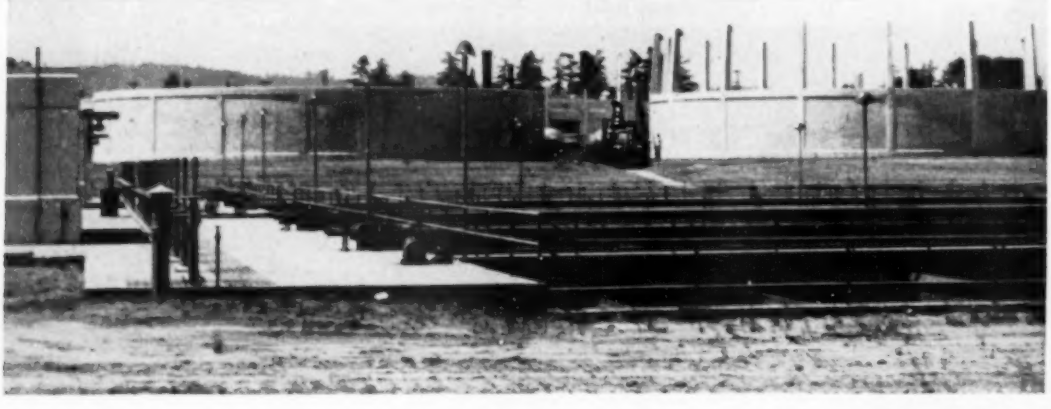
Ahead of Contract

As the need for shafts expires, they are backfilled to become standard manholes. The Kuckenberg firm expects to have the tunnel completed ahead of contract. This is welcome news to city engineers, since the treatment plant is already in partial operation.

Key personnel working on the project include: Lee Gordon, superintendent; E. Anderson, assistant superintendent; R. Stevens, night superintendent; M. Henderson, engineer; B. Soucie, office manager; and W. Powell, E. Hageneur, H. Dunn, E. Snider and G. Jensen, foremen.

Additional aids for workers in the tunnel were the installation of 8-in. blower fans with canvas bellows-type ventilating pipe and inter-office type communications system between surface and tunnel crews.

• This modern treatment plant has been completed and awaits connection with new interceptor line. Meanwhile the City of Portland's H-3 Hydrocrane does last-minute pipe laying and general maintenance work.



"EUCS" for

Powered by two 200 h.p. diesel engines, Model FFD "Eucs" haul 34 ton loads of earth and rock overburden at Monroe Mine of Oliver Iron Mining Co. in Minnesota.

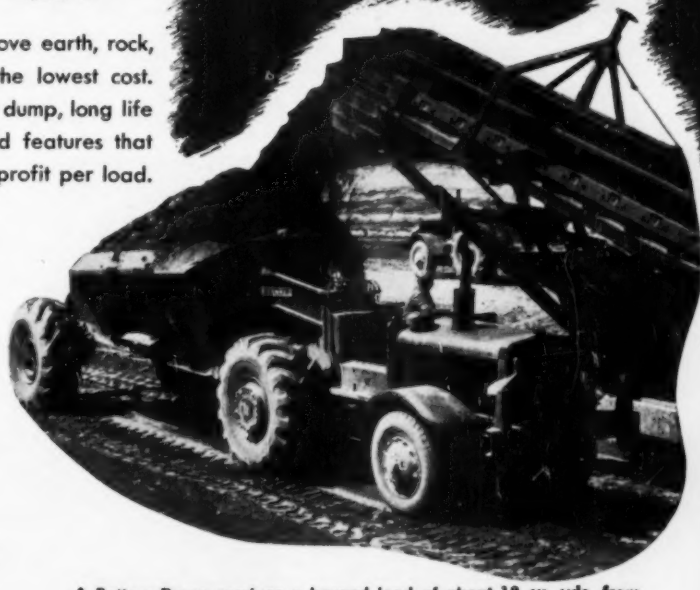
LOW COST HAULING ON TOUGH JOBS

Euclids are designed and built to move earth, rock, coal, ore and heavy excavation at the lowest cost. Large capacity, speed on the haul and dump, long life in heavy duty service, these are Euclid features that assure more loads per hour and more profit per load.

They haul big loads! Bottom-Dump Euclids have capacities of 13 to 25 cu. yds., Rear-Dump "Eucs" from 10 to 34 tons.

"Eucs" are fast! Top loaded speed of the Bottom-Dump is 34.4 m.p.h. Rear Dumps travel up to 36.3 m.p.h. with full payloads. They're powered by diesel engines from 125 to 400 h.p.

Whether you have a tough off-the-highway hauling job, or one where conditions are good, Euclids are your best bet for low cost hauling and long, dependable service.



A Bottom-Dump receives a heaped load of about 18 cu. yds. from a Euclid Loader during construction of an access road to a Hydrogen Bomb Plant site in South Carolina. Contractor: R. B. Potashnick.

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News from the Field

Rush Airfield Construction In North Africa

A $300 million project will put five airdromes in operation in the northwest African sultanate of Morocco. This is a cooperative venture between the United States government and the French protectorate regime in Morocco.

Already America's biggest bombers could roar into action from two of the bases carved from the farmlands and deserts in the last seven months. The first two are far from complete but could be fought from if necessary. Ground is being broken for a third field and sites have been staked out for two more.

This is generally believed to be the largest contract ever let with five civilian engineering firms forming a joint venture under the name of the Atlas Construction Co. They are the Morrison-Knudson Co., Boise, Ida.; Ralph Mills, Frankfurt, Ky.; Blythe Bros., Charlotte, N. C.; Nello Tier, Durham, N. C., and Bates & Rogers, Chicago.

The two bases which are already usable are at Sidi Slimane and Nouasseur. Both have runways 11,000 feet long (more than two miles). On the surrounding wastes, cities are rising to house the thousands of workers.

Over 3,000 workers were recruited from throughout the United States with an equal amount still needed. About 8,500 French and Arab workers are on hand. This figure too must be doubled as work progresses. Heading this project involving two governments, three nationalities and two branches of the United States military service is Col. George T. Derby, district engineer for the east Atlantic district.

All five bases are expected to be finished late this year or early in 1953.

Pilot Car Leads Motorists Through Construction Area

A pilot car operated by the Maine State Highway Department guides traffic through a resurfacing project on route 26 at Poland, Me. The state highway maintenance division, in placing a new surface on 2.5 miles of bituminous macadam highway, is trying this new method of controlling traffic.

A state-owned vehicle, well marked by a descriptive sign, leads a line of one-way traffic back and forth, thus controlling the speed of the following vehicles. By this procedure cars and trucks are kept off the freshly spread bituminous materials and are prevented from damaging the new pavement before it hardens.

Motorists have commented favorably on this method of controlling traffic. They say that fewer delays and traffic jams develop.

Michigan Iron Mine To Be Restored

A long dormant iron ore property in the Marquette range on the upper peninsula will be developed immediately by the Ford Motor Co. and the Cleveland-Cliffs Iron Co.

No estimate of cost was available when Ford recently announced the privately financed project. A new company, known as the Humboldt mine, will be formed by the two companies to develop and operate the property located in Marquette county near Humboldt.

By 1955, 400,000 tons of concentrated iron ore are expected to be produced each year. The crude ore will be mined from an open pit and passed through concentrating units. This will produce a product substantially higher in iron content than the ores now being mined in the Lake Superior region.

The first of the concentrating units will be capable of producing 200,000 tons annually, with capacity production expected by late 1953. A second unit of similar capacity is scheduled to be in operation by 1955.

Shipments of iron ore concentrates to Ford will begin as soon as the first concentrating unit is completed. Ford uses two million tons of ore a year.

In 1896 Thomas Edison spent some time and money at Humboldt in the erection and operation of an experimental mill for the magnetic separation of local ores. A fire destroyed the plant before any definite results were obtained and it was never rebuilt. Little more was done until 1947 when Cleveland-Cliffs began preliminary exploration of the area.

This is the second big project to be announced for the upper peninsula. Recently the Reconstruction Finance Corp. announced approval of a $57,185,000 loan for development of a large copper deposit. The White Pine Copper Co. received the loan to handle the project. Defense considerations have made copper and iron needs more vital.

First Bonds Redeemed By Maine Turnpike

The Maine Turnpike Authority has announced retirement of $181,000 worth of the $20 million revenue bond issue which financed construction of the 45-mile Kittery to Portland toll superhighway.

Retirement of the bonds was the

• Indiana's Governor Henry F. Schricker (left) doted the use of spades in groundbreaking ceremonies when he helped take over the controls of contractor Joe Owens' International TD-24 crawler tractor and Bucyrus-Erie dozer. The first bladeful of dirt was moved at recent dedication ceremonies of the $1,750,000 water reservoir for Bloomington, Ind.

first step in paying for the toll highway, which has served more than seven million motorists since its opening Dec. 15, 1947.

The action cut the interest load of $529,000 a year by $4,525, with additional redemptions anticipated in the next two months.

Despite the fact that turnpike revenues during the first year of operation failed to meet interest charges by about $70,000, the authority said that traffic gains in subsequent years made up these early deficiencies.

Texas Flood Money Assigned to Projects

The $14,539,000 recently appropriated by Congress for Texas flood control projects being constructed under supervision of the Fort Worth District, Corps of Engineers, has been earmarked for eight projects. The projects in the Brazos, Colorado and Trinity River Basins are as follows: Whitney Dam and Reservoir, Belton Dam and Reservoir, San Angelo Dam and Reservoir, Lavon Dam and Reservoir, Garza-Little Elm Dam and Reservoir, Benbrook Dam and Reservoir and Fort Worth Floodway.

Funds for basin-wide surveys of Texas rivers for flood control and allied purposes were not appropriated by Congress.

Mine Office Opens in Boston

Establishment of a U. S. Bureau of Mines office at Boston, Mass., to conduct a special survey of mineral resources of the New England states and New York was announced recently.

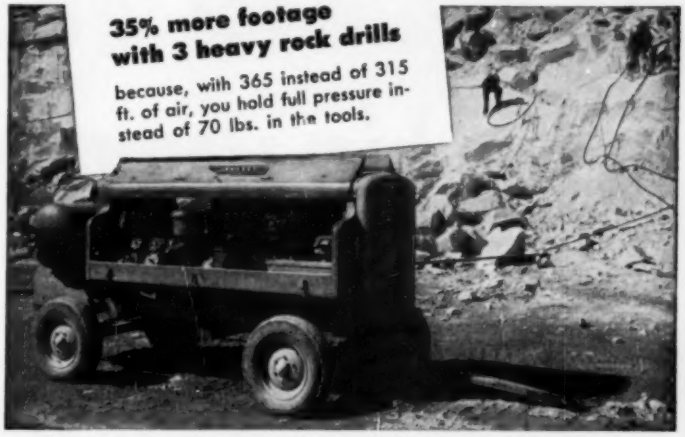
Headed by Hugh P. Nicholson, mining engineer from College Park, Md., the Boston staff will include Stanley A. Feitler, also College Park, and Donald W. Mitchell, Bluemont, Va., both mining engineers. Offices are in the Cummings Building, 261 Franklin St., Boston.

It was reported that the decision to establish a field office in Boston was made because it will be easier to complete the far-reaching study of mineral resources the Department of the Interior has authorized the Bureau of Mines to undertake for the New England-New York inter-agency committee. The Bureau of mines will prepare several sections for the mineral resources work group of the committee, such as a history of the mineral industry of the region, a commodity-by-commodity study of mineral industry technology and economy, and economics of the mineral industry.

Continued on page 38

same men, same tools do

4 days' work in 3


35% more footage
with 3 heavy rock drills
because, with 365 instead of 315 ft. of air, you hold full pressure instead of 70 lbs. in the tools.

75 ft.
125 ft.
185 ft.
250 ft.
365 ft.
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JAEGER "Air-Plus" COMPRESSORS

deliver 15% to 25% more 100 lb. air at lowest cost per cubic foot of any compressors on the market, to run tools at their full efficiency.

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The HEAVY-DUTY FLOOD LAMP THAT

Lights Your Work Better . . . Gives Longer Service at Lower Cost

Vibration-absorbing Base

Specially Designed for Efficient Service on

Shovels — Excavators — Drag-lines
Roadbuilding Equipment
Locomotive Cranes — Tractors

"BUILT to take it," say users of STURDILITE Heavy-Duty Flood Lamps, after years of trouble-free service. Hermetically sealed-beam lamp—no reflector to become tarnished. Complete assembly mounted on rubber cushioned base that absorbs vibration and shocks. Available in 6-8, 12-16, 24-28 and 110-120 voltages.

COMPLETE BULLETIN, specifications, and quantity prices sent promptly upon request.

Metal Spinning Division

PHOENIX PRODUCTS COMPANY

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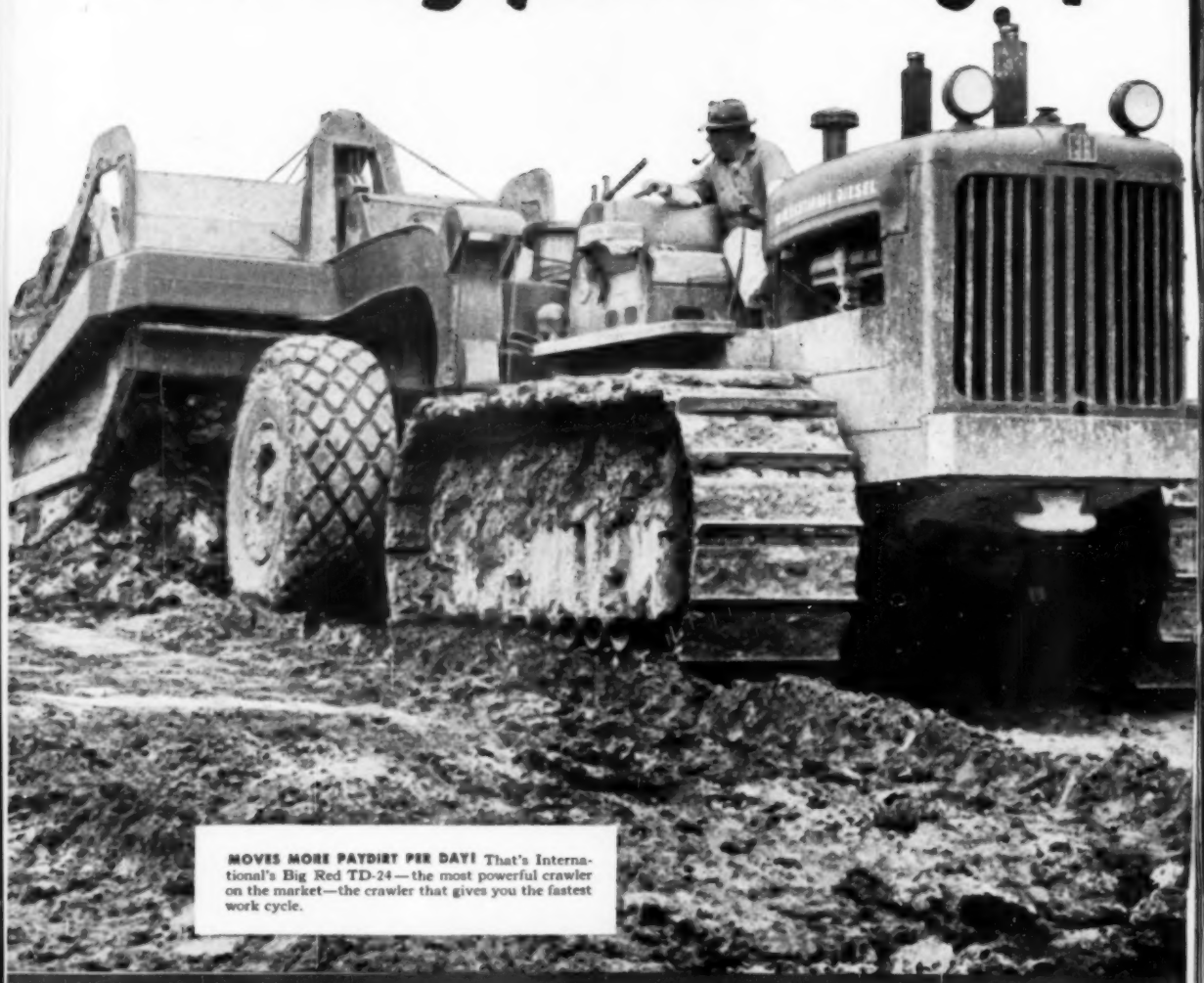
Keep 'em Working
in the big year coming up



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Here's help... where and when you need it... with your International Industrial Distributor's ready service and parts departments

Your crawler tractors have to pay off with more work done per day, more days worked per year.

That means speed and power. The ability to stay on the job. Minimum downtime.

And it also means fast maintenance service at your call, when and where you need it.

That's your International Industrial Distributor's service—service that includes

TRAINED "DIESEL DOCTORS"—factory-trained specialists in maintenance and overhaul.

PROMPT FIELD SERVICE at your job site to help keep your equipment working, to get it back to work faster, to cut costly downtime on the spot.

COMPLETE SHOP FACILITIES for major work—you're never far from an International Distributor's shop, no matter where your equipment goes.

QUICK PARTS SUPPLY from your distributor's fully stocked parts department, backed by International Harvester's network of strategically located parts depots (in size and scope, exclusive in the industry).

Isn't this *complete* service a mighty good reason to get International *"Power that Pays"* for the hard-working years ahead?

INTERNATIONAL HARVESTER COMPANY
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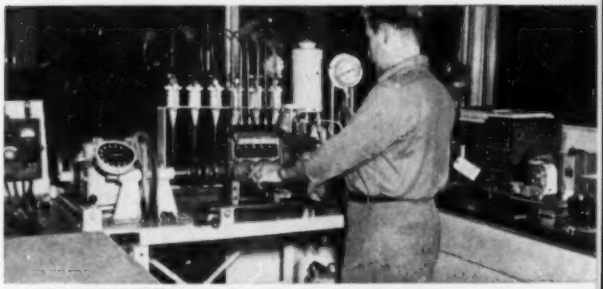
POWER THAT PAYS

INTERNATIONAL HARVESTER

YOU NAME IT—your International Industrial Distributor has it in his big, efficient parts department. And if he hasn't, he can get it fast from his nearby International Parts Depot.



"HEART SPECIALIST!" A crawler's heart is its sturdy fuel pump. It seldom needs attention. When it does, this "diesel doctor" operates with precision instruments in a special dust-free room.

HERE'S HELP WHEN YOU NEED IT. Skilled, experienced mechanics equipped with the right tools for doing major maintenance fast at your International Distributor's shop.

ON THE JOB. Here are an International Distributor's field servicemen, on the job at the job site installing an overhauled transmission. A phone call gets this kind of service.

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Engineers, contractors and operators of heavy industrial machinery and equipment throughout the world always will be efficiently and adequately served by instructing American producers to ship through

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By so doing you benefit by our extensive experience in shipping power shovels, drag lines, bulldozers, road making equipment, hydro-electric power installations, oil refineries, trucks and automobiles, and all classes of heavy machinery for export . . . for the United States Government and many foreign governments, as well as the most prominent American exporters. Our professional skill, unexcelled reputation, and financial stability are at your service when you call on CALDWELL.

News

Continued from page 35

Another report will cover potential development of the mineral industry in the region and will be prepared jointly by the bureau and the geological survey, another Interior agency.

More than 50 minerals and industrial commodities will be covered in the bureau's study, which is expected to require at least two years to complete.

The New England-New York interagency committee, created to make a comprehensive survey of the land and water resources of the region, is composed of one representative each from six federal agencies: the departments of Agriculture, Army, Commerce, and Interior, the Federal Power Commission, and the Federal Security Agency.

Governors of the seven states in the region and their representatives are cooperating with the committee.

Goal of the group is the preparation of a detailed report which will include recommendations for the development, utilization, and conservation of resources in the states of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island and Vermont.

Flexible Plastic Pipe Aids Mining Operations

Universal Mineral Recoveries is using 2 and 6-inch sizes of Carlon plastic pipe in conjunction with the recently developed Goody saving equipment. By means of a new process, gold, silver, lead and other valuable minerals are being recovered from the mill tailings left in the 1860's and 70's by the operators of the Old Vulture mine near Wickenburg, Ariz.

In this operation, 2-inch diameter pipe is used under pressure to undercut the banks of tailings to facilitate the recovery procedure. The material containing mineral deposits then is pumped through the 6-inch size to the recovery equipment. Eight-hundred feet of plastic tubing is being used as conduit for the electric wires to the 60-hp motor powering the dredge pump.

Turner Elected to Board Of NYC Association

Election of Henry C. Turner, Jr., president of the Turner Construction Co., as a member of the board of directors of the Commerce and Industry Association of New York, Inc., was announced recently.

A native of Brooklyn, N. Y., Turner graduated from Swarthmore College in 1923 and went with the Turner Construction Co. as a timekeeper shortly thereafter. In January, 1938, he was named vice president of the company in charge of the Philadelphia office, where he served until March, 1947, when he was elected president with headquarters in New York city.

Currently Turner is a member of the board of directors of Liberty Mutual Insurance Co., treasurer and a director of the New York Building Congress and a member of the executive committee, director, and chairman of the building division, of the Associated General Contractors of America.

Safety Drive Support Asked by AGC President

Glen W. Maxon, president of the Associated General Contractors of America, today made public the text of a letter which he has sent to the presidents of the 118 chapters and branches of the association in all parts of the country.

The letter recommends support of the safety program developed by the A.G.C. accident prevention committee, the chairman of which is H. B. Alexander, of Harrisburg, Pa. The letter read in part as follows:

"This letter is addressed to you at a time which I consider critical. In 1950 there were 2,300 deaths and 205,000 injuries in the construction industry. There were 93 deaths per 100,000 workers in construction, while the average of all other industries was 27. Only one industry, mining, had a poorer record with 110 deaths per 100,000 workers. Our industry had the highest number of total injuries per 100,000

Tiger Brand Wire Rope

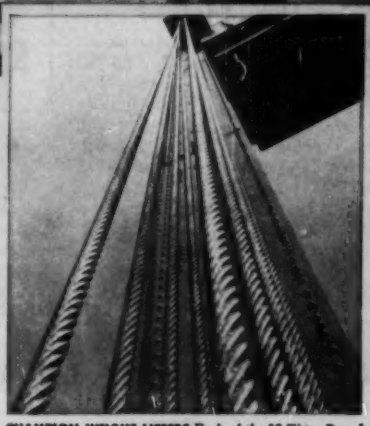
lifts largest single-plate girder span ever erected

WARD'S ISLAND LIFT BRIDGE for pedestrians connects Manhattan and Ward's Island.

● The Ward's Island Lift Bridge connecting Manhattan and Ward's Island is reputed to be the largest single-plate girder span ever erected. This is a pedestrian bridge spanning part of the East River. The center span is 312 feet 2¼ inches long and is designed for an 80-foot lift.

The main span weighs 375 tons and is hoisted by 32 U·S·S American Tiger Brand Wire Ropes 1⅜ inches in diameter. The ropes are prestressed 6 x 19 Monitor Steel with Fibre Core. This construction has the requisite strength combined with the proper flexibility to give long service.

On big jobs requiring utmost dependability, engineers choose a wire rope that has proved itself in service. That's why they select U·S·S American Tiger Brand so often. But whether your job is big or small, you can find a Tiger Brand Wire Rope designed to fit your needs. Let our wire rope specialists help you choose the Right Rope for your particular jobs.



CHAMPION WEIGHT LIFTERS Each of the 32 Tiger Brand Wire Ropes supporting the center span lifts 11.7 tons with plenty of excess strength for safety.

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Please send me your Recommendation Booklet, "The Right Rope for the Job."

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UNITED STATES STEEL

workers, a total of 8,300, with the average for all industries being 3,360. Our frequency rate for disabling injuries is double the average of all industries."

List 1951 Road Costs For Minnesota

Minnesota's State Highway Department announced that more than $40 million worth of road improvements were placed under contract in the state in 1951, including some $30 million worth of trunk highway construction.

Additional costs of engineering, surveys and plans brought the total state highway program contracted during the year to $33 million. Also, $7,328,000 in county-federal contracts were let by the highway department for county road improvements financed with matched federal-aid funds.

Dollar value of both the state work let and the federal-aid projects contracted for the counties set all-time records.

Reveal Transport Costs For New England

A survey by the New England Council reveals that approximately $1,140,000,000 has been spent to improve New England transportation facilities since 1945.

The expenditures are as follows: highways, $832 million; railroads, $178 million; port facilities, $25 million; airports, $55 million; local transit facilities and intercity buses, $46 million, and motor freight carriers, "millions more."

Motor freight carriers reported total truck mileage in the area increased from 134 million in 1946 to almost 191 million in 1950.

The survey found that all but $140 million of the $832 million spent during the period on New England's 19,800-mile highway system was state money. The survey report said that this expenditure produced 1,826 miles of new highways and 1,569 miles of reconstruction.

The expenditure of $55 million on airport construction in the six New England states since 1945 was attributed to the great postwar expansion of air commerce. Commercial airports in the area now number 95, with 18 either enlarged to this status, or brand new, since 1945. It was noted that 13 airlines serve 42 New England communities with 760 landings and takeoffs daily.

The $178 million spent by railroads includes the rebuilding and improvement of 1,500 miles of trackage and roadbed.

William P. McDonald

William P. McDonald, 71, prominent as a construction and citrus executive, died Nov. 20, 1951 at his home near Lake Wales, Fla.

At the time of his death he was president and a director of the Florida Stone Co. of Ocala, chief executive officer of the William P. McDonald Corp., a director in the Federation Bank and Trust Co. of New York City, a director of Lumber Mutual Casualty Co. of New York City and a member of the Elks.

Mr. McDonald came to Florida from New York in 1915. He was one of five contractors who helped construct Florida's first system of county roads which was begun in 1916. He was the contractor of the first county road under Polk County's original road bond issue. This road is now part of what is referred to as old U. S. 92 running parallel with the Atlantic Coast Line Railway from Osceola to the Hillsborough County line.

He continued in the road construction business until about 1930 when he went to Canada to carry on extensive road building there.

Mr. McDonald was also responsible for extensive real estate developments in Lakeland, Fla. and was one of the foremost men in the state's citrus industry.

He is survived by his wife, three sisters, three daughters, and one brother.

When You Call For Any Industrial Requirement In Piping

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"Rings the Bell"

SPEEDLAY PIPE SYSTEM—completely packaged for fast-laying temporary and semi-permanent lines for water, compressed air, and other services.

PILING—Sheet Piling—light weight • Tubular—all sizes

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VALVES & FITTINGS—Tube turns, Dresser, Vitaulic, cast iron or steel, forged steel, special alloys, water main.

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Single Engine Speeds Dredge Output

One engine with push button control performs a variety of operations on a new gravel-pumping dredge recently put into operation by the Consumers Sand and Gravel Co., of Kalamazoo, Mich. Instead of two or three engines or a combination of engines and electric motors as generally employed, a single General Motors 6-110 Diesel engine does the entire job. Incidentally, this greatly simplified arrangement has speeded up the company's production of gravel, road stone and plastering

Continued on page 44

ALWAYS OUT FRONT WITH

Long-Life Service

The impressive service records of Bucyrus-Erie stripping shovels and draglines mean shift-after-shift, year-after-year performance in moving millions of yards of overburden at economical cost. These records amply prove the superiority of Bucyrus-Erie "years ahead" design and the top quality of Bucyrus-Erie craftsmanship — backed by the most extensive field experience of any excavator manufacturer. Bucyrus-Erie stripping shovels and draglines are available in capacities from 2½ to 36 cubic yards to fit any open-pit mine requirement.

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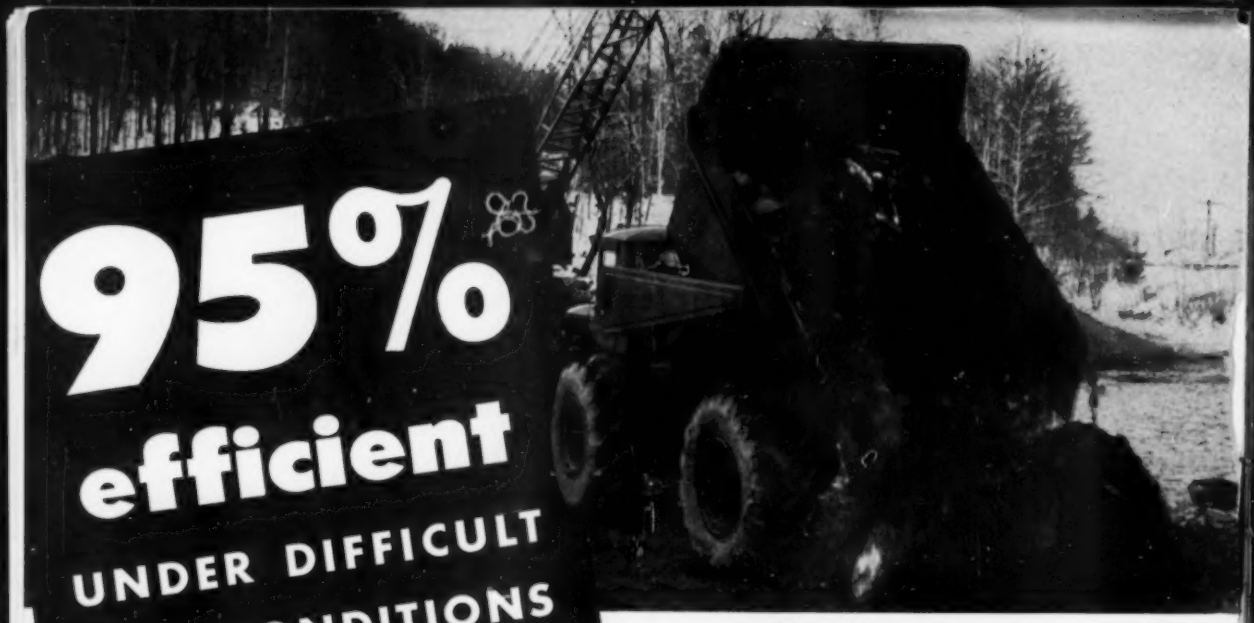
BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

TOURNAPULL TOURNAROCKER TOURNACRANE TOURNAMIXER



95%* efficient

UNDER DIFFICULT JOB CONDITIONS

for F. Whitcomb

Tournarocker makes short, 90° turn out of cut onto main haul road . . . travels at high speeds through open traffic and up 5 to 6% grades on 1½-mile haul to dump. These 2 rear-dump, electric-control haulers are Whitcomb's latest LeTourneau units. He bought his first LeTourneau dirtmovers in 1937 . . . has been a regular repeat buyer since then.

NEW C Tournarockers now have 18-ton body increasing capacity by 12½%. Prime movers with Tournamatic transmission and torque converters are also available, as well as the "Roadsters" with their heavy-duty, sliding-gear transmission. Performance figures reported here were made with earlier 16-ton Roadster units.

Tournamatic, Tournarocker—Trademarks 8243

LETOURNEAU PEORIA ILLINOIS TOURNAROCKERS

HIGH SPEED on RUBBER PLUS TRACTION ADVANTAGES of a CRAWLER

Electro-heated body speeds sub-zero dumping. To speed completion of the 24-ft. sub-grade for 2.8 miles of Rt. 103 along Lake Sunapee, Frank Whitcomb worked Tournarockers well into the winter. Electrical induction heating of 'Rocker body kept load from freezing . . . allowed fast, free dump even in sub-zero weather. Other machines, unheated, had to be cleaned out by a small pull shovel.

Construction Corp.

2 C-TOURNAROCKERS move 51 to 56 pay yds. hourly on 3-mile cycles through traffic

Frank W. Whitcomb Construction Corp. of North Walpole, New Hampshire, have a lot of solid rock in the 245,000 yds. of excavation they're handling on relocation of 2.8 miles of Rt. 103 near Newbury. Even the common earth is hard to handle because of large boulders. Hauls are long . . . averaging 1½ miles one-way over existing highway through heavy, open traffic.

Load 10 pay yds. of broken rock ...up to 15 loose yds. common earth

To speed production under these tough conditions, Whitcomb has assigned most of the difficult hauling to 2 high-speed, rear-dump, 16-ton C Tournarockers. Teamed with a 1½-yd. shovel, each "C" carries 10 pay yards of high-void broken rock per load . . . up to 15 loose yards of common earth per trip . . . makes a 3-mile cycle of load, haul, dump and return every 18 to 19 minutes. In a typical 9-hour day, each Tournarocker delivers 25 loads over rutted, steep ground to the dump . . . in a 7-hour day on this length haul, figures show each "C" moves 18 to 19 loads. That's a total average production for the 2 rigs of 51 to 56 pay yards of rock per hour . . . 75 to 80 loose yards of common earth hourly.

"We're very well satisfied," says Supt. John T. Fox. He also stated that Tournarockers have been about 95% efficient under these difficult job conditions.

Check Tournarocker on your job

If you're near New Hampshire, by all means visit one of the Whitcomb jobs. See for yourself what job-proved 35 m.p.h. Tournarockers can do for you . . . or ask your LeTourneau Distributor for facts and figures on work like yours.

Profit insurance—Tournarocker body is readily interchangeable behind "C" prime mover with equipment shown below.

13.5-yd., 16-ton TOURNAPULL | 15-yd., bottom-dump TOURNAHOPPER | 20-ton, flat-bed TOURNAHAULER | 15-ton lift TOURNACRANE | 6 or 7-yd., transit-mix TOURNAMIXER

FOR EASIER-FASTER Drilling

THE McCARTHY VERTICAL DRILL

For record-breaking performance . . . for ease of operation, you can't top a McCarthy Vertical Drill. Recently, on one difficult job, workers using McCarthy equipment drilled an 8-inch hole 100 feet deep in only 40 minutes! The derrick is raised and lowered by hydraulic power . . . finger tip controlled . . . and a 60 H. P. gasoline motor is part of the standard equipment.

The McCarthy Vertical Drill, manufactured by The Salem Tool Co., is adaptable to high wall and key way drilling and diamond drill boring . . . drills 90% of all limestone and sand rock formations, and readily burrows through shale. Send today for complete information, and for a free copy of The Salem Tool Company booklet.

MINING EQUIPMENT SINCE 1901

SALEM

THE SALEM TOOL COMPANY

SALEM, OHIO, U. S. A.

News

Continued from page 40

sand. It has also given a more even flow of material and reduced hazards to driving machinery. There have been fewer shutdowns and much simpler operation.

The engine drives the main pump, priming pump, stone ladder and winches all through system of power take-offs. The clutch mechanism of the eight-inch Hubscher stone ladder can be reversed and also "slippage" occurs when a heavy obstruction is encountered or in the event the ladder is buried by a cave-in. In such cases the ladder is automatically rendered inoperative until the operator, by throwing it into reverse can pull it away from the obstruction. This feature prevents damage to ladder parts and driving machinery thereby eliminating costly downtime periods. It also enables the operator to perform maintenance and other duties rather than stand constant guard at the controls.

The ladder is equipped with extra heavy claws and has sufficient power to break through hard pan and clay formations to expose lower layers of usable material. Rocks too large to negotiate the nozzle and pipe successfully are, of course, lifted and deposited well to the rear. When the pump material is deposited on shore to drain, it has already been subjected to a re-washing due to the vigorous tumbling it receives in the eight-inch Hetherinton-Berner pump.

The dredge is 100 feet long by 16 feet wide and is built of 5/16 inch plate. It has nine water-tight bulkheads and will remain afloat with any two of them flooded. Carefully designed flotation assures perfect "trim" of the dredge regardless of position of the ladder. The suction pipe is 75 feet long and will dredge to a depth of 50 feet without adding additional pipe.

Ky. Highway Department Urges Scrap Drive

"Contractors and equipment suppliers as well as highway department garages are being urged to survey and report on scrap metal to help reduce the shortage of steel," W. P. Curlin, Kentucky commissioner of highways, said recently. District engineers have been directed to "file information regarding the possible tonnage of scrap metal along or adjacent to the public highways."

"A number of important projects are being delayed in Kentucky because of the shortage of road and bridge steel," Curlin continued. "Our survey is being made at the request of the American Association of State Highway officials for the National Production

● Overall view of Consumers Sand and Gravel Co. operation near Kalamazoo, Mich. showing newly installed pumping dredge which changed the company's gravel producing method from "dry" to "wet." In background is new 150 foot concrete tunnel housing conveyors which run to screening and crushing plant on hill.

Authority. Definite efforts are to be put forth to recover the great quantities of necessary metal now rusting away in scrap heaps."

The Highway Herald, official publication of the employees of the highway department, recently urged "confiscation of automobile graveyards which dot the picturesque countryside."

"One old automobile represents about a ton of steel scrap," the Herald stated. "In open hearth steel making, the content of the furnace must be half scrap and half pig iron. There are literally millions of junked automobiles in the country which will never produce a single usable part. Yet, the owner permits the junk to rust away and blot the landscape."

Alaskan Engineers Issue Construction Outline

The Alaskan District, Corps of Engineers, has just compiled the 1952-53 Prospectus of Construction. It is intended to serve as a basis for understanding the scope of construction planned for Alaska during the coming year. A revaluation of the part Alaska plays in the world's defense strategy has caused military authorities to concentrate the building program to the heartland of Alaska. It has also been decided that all construction in Alaska must be of a permanent type.

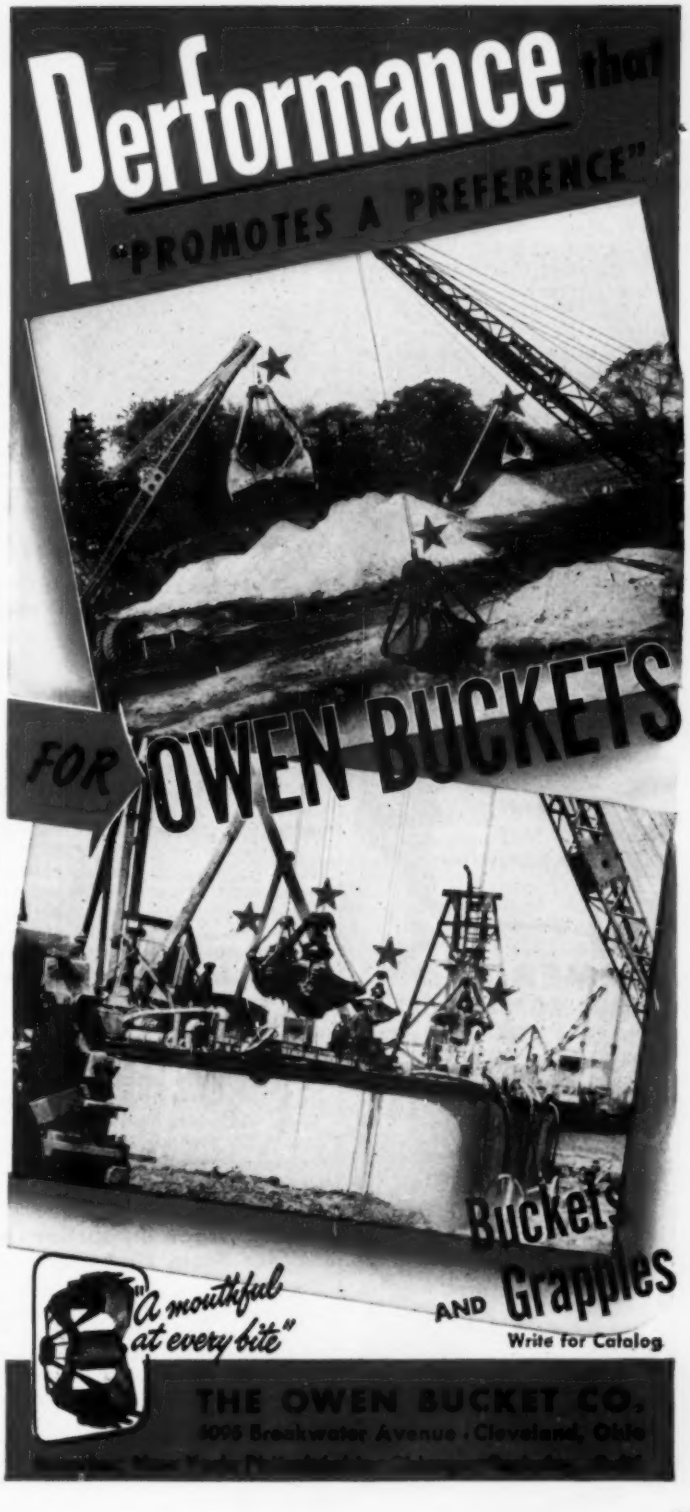
In addition to listing proposed construction projects the following topics are also discussed: construction now in progress, labor, concrete, weather data, facilities for contractors, transportation facts, types of contracts and recreation.

Copies of the prospectus can be obtained by writing to the district engineer, Corps of Engineers, U. S. Army, Anchorage, Alaska.

Western Road Test Planned

The Highway Research Board of the National Research Council in Washington, D. C., has completed negotiations with ten state highway departments of the Western Association of State Highway Officials to permit the board to conduct a full-scale test of bituminous pavement in southeastern Idaho.

Cooperating in the test are the highway departments of California, Colorado, Idaho, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming, the Bureau of Public Roads, and the petroleum industry. Assurance has been given that test trucks will be furnished by truck manufacturers of the Automobile Manufacturers Association, provided they do not become



committed to a greatly increased defense production effort.

The test road will consist of two enclosed loops, each with two 1,900 foot straightaways of test pavements. The design of the pavements in the two loops will be identical.

Controlled test traffic consisting of two different prevailing weights of single-axle trucks will be used on one loop, and two different prevailing weights of tandem-axle trucks will be used on the other. Pavement on the test sections will vary in thickness from 6 to 22 inches, and the relative effects of the different types of test trucks on all sections will be determined and the results utilized in future design. Careful records of the cost of maintaining the various sections will be kept as an aid in determining the "real cost" of each highway type.

Plans approved by the Western Association of State Highway Officials have been submitted to contractors for cost estimates. Negotiations with the low bidder will be completed within the next few weeks. Construction will be started early this spring, and the pavement should be completed early in August. Shortly thereafter, controlled test traffic will be started on the test sections and will be operated until stopped by winter weather. The test will be started again in the spring of 1953 and continued for about three more months.

• Enos Coal Mining Co., Oakland City, Ind. has increased production with the use of 300 hp Model NHRBS-600 Cummins Diesels in 50-ton Dart and 35-ton Mack coal haulers, despite a lengthened haul from the pits to the mine's coal washer. The Dart pictured, although rated at 50-tons, actually hauls closer to 60 tons — more than a railroad coal hopper car. Fuel consumption is about five gallons an hour.

Name Construction Engineer for Idaho Project

Appointment of Louis B. Ackerman, long-time career engineer in the Bureau of Reclamation, as construction engineer for the Palisades Project in eastern Idaho, was announced recently.

A graduate of the University of Idaho, Ackerman is currently chief of the construction branch of the bureau's large-scale operations in the upper half of the Missouri River basin, with offices at Billings, Mont.

Donald Jerman, who for six years has been in charge of preconstruction surveys for the project, has been promoted to the post of an assistant to the construction engineer.

Henry Patrick (Pat) O'Donnell, earth-dam engineer from Coulee Dam, Wash., was named field engineer, with supervision over all field engineering for the construction of the dam and tunnels.

$500 Million Apportioned for State Highways

Apportionment of the $500 million authorized as federal aid to the states for highways in the fiscal year beginning July 1, 1952, was announced recently. The funds were authorized by the Federal-aid Highway Act approved Sept. 7, 1950.

The Act provides $225 million for projects on the federal-aid highway system, $150 million for projects on the federal-aid secondary system, and $125 million for projects on the federal-aid highway system in urban areas.

Funds will be expended under the supervision of the Bureau of Public Roads. According to the General procedure in use for many years, state highway departments propose projects, prepare plans, award contracts, and supervise construction with all expenditures subject to federal approval. Federal participation is limited to half the cost. The exceptions are the public-lands states where participation may be increased above 50% by one-half of the percentage of the area of the state that is public land.

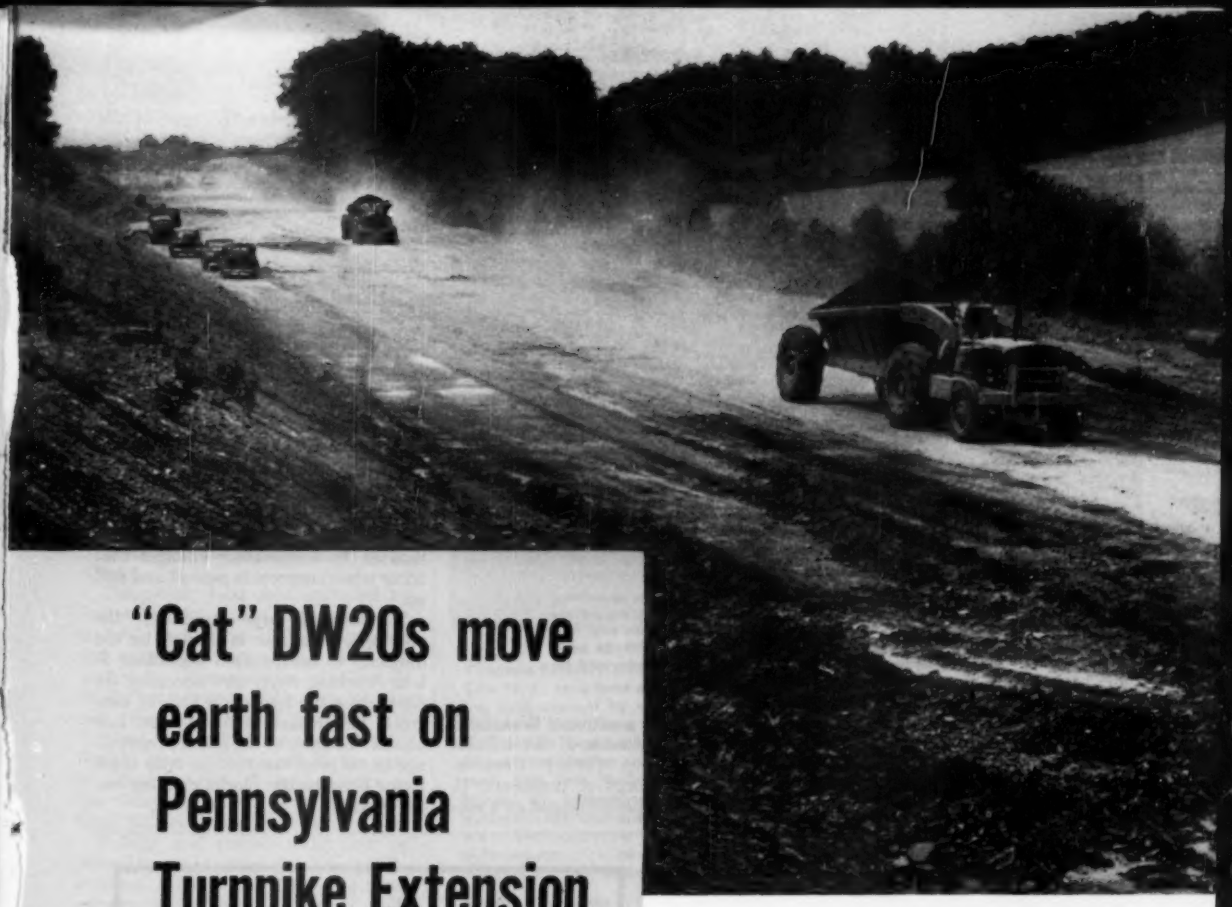
Funds for the Federal-aid highway system are apportioned according to area, population and mileage of post roads, each being given equal weight. The funds will be available for expenditure until June 30, 1955.

Wanamaker Resigns N. J. Turnpike Post

W. W. Wanamaker has resigned his post as executive director of the New Jersey Turnpike Authority to become chief engineer of the Orinoco Mining Co., it was recently disclosed. The authority has not yet picked a successor.

The Orinoco Mining Co. is a United States Steel subsidiary, charged with the job of developing iron ore deposits in Venezuela. Wanamaker will be in the New York offices of the company.

Wanamaker said he was leaving the turnpike project with great reluctance but with the certainty that work had now proceeded to the point where he could step out without handicapping the authority. High in praise of the



"Cat" DW20s move earth fast on Pennsylvania Turnpike Extension

Two of L. G. DeFelice & Son's "Cat" DW20s and W20 Wagons roll to the fill at 25 mph. with 20-yard loads. This $7,000,000 contract calls for moving 500,000 yards of earth.

L. G. DeFelice & Son, contractors on a 16-mile stretch of the western turnpike extension between Warrendale and Homewood, Pa., use eight "Caterpillar" DW20 Tractors and W20 Wagons for long-haul earthmoving. Handling 20 to 23 pay yards at a load, and making 2½ round trips per hour over a 1¼-mile haul route, the "big rigs" are operating 12 hours a day. That means the eight machines are hitting a daily average of close to 5,000 yards.

DeFelice's master mechanic likes the trouble-free operation of these husky wheel tractors. They outwork competitive equipment. And the fact that they're completely "Caterpillar"-built, including the engines, makes it easy to maintain and service them right along with the four D8s, six No. 12 Motor Graders and three No. 80 Scrapers that round out the "Caterpillar" fleet.

Wherever long, fast hauls call for wheels, the DW20 is making a reputation for big production and over-all economy. Owners who value such equipment take extra-good care of it these days. Proper maintenance will add to its long work life, and regular inspection by the "Caterpillar" service man will prevent down-time for repairs.

Your "Caterpillar" Dealer is the best friend your machines have. Make the most of all he has to offer.

CATERPILLAR, PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

● Seeking every safeguard against fire in an area recently ripped by two devastating gasoline explosions, the Sinclair Oil Co. is building seven-foot fire walls around two of its 80,000-barrel tanks on this tank farm at Hartford, Ill., just across the river from St. Louis. Contractor Bob Swann, Wood River, Ill., used an International TD-18A crawler with Bucyrus-Erie hydraulic bulldozer to form the walls. The 7,000-cubic-yard job required seven working days to complete.

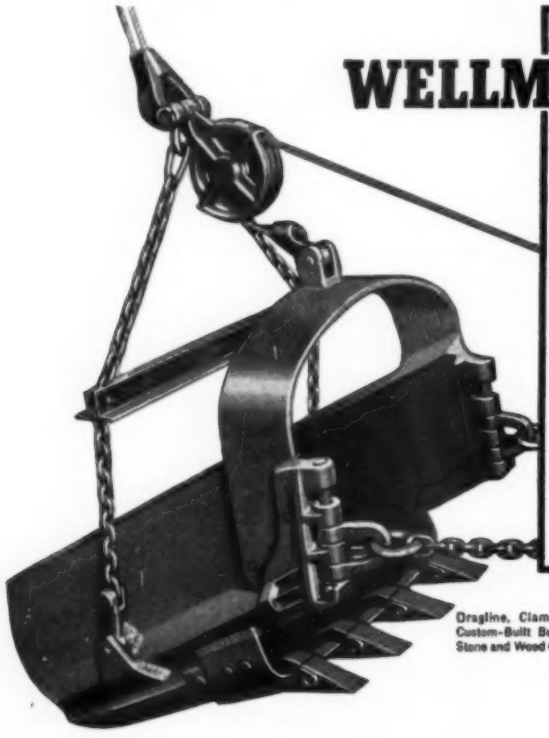
members of the turnpike authority and of Governor Driscoll, Wanamaker said he had received "the utmost in cooperation" from the three authority members and the governor.

Wanamaker is a native of Wakefield, Mass., and a graduate of West Point Military Academy (1918). Commissioned in the Corps of Engineers, U. S. Army, he has been engaged on a succession of civil works projects of the corps. He retired from his post as district engineer, New York city, with the rank of brigadier general and became the turnpike authority's first executive director in December 1949.

New Water Stop Used in El Salvador

A new water stop made of Geon polyvinyl plastic, a product of B. F. Goodrich Chemical Co., is being used at the Guayabo hydroelectric project, now under construction in El Salvador, Central America. The water stop is easier to install than types previously used in dam construction. It is made of vinyl plastic to provide superior aging characteristics, extreme resistance to the chemical action of concrete and resistance to temperature changes that occur when concrete is poured and sets up.

In building large structures, the pouring of concrete is limited by the difficulty in mixing such quantities, 8-hour working days, and necessity for dissipating the hydration heat of concrete. This means dividing pours into blocks. Because of the inherent shrinkage factor in all concrete, an open crack forms between the blocks creating water leakage.



WELLMAN *Williams Type*

MORE YARDAGE PER DAY

● Elimination of excess materials and careful weight distribution permit rapid, rhythmic operation of Wellman Dragline Buckets. Operators can cover a wider digging radius with this streamlined bucket.

Built of special alloy steel, using strong welded design, Wellman buckets provide strength and stamina for long-term economy. Perforated designs also available. You'll do better with Wellman.

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7000 Central Avenue
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To eliminate this leakage between joints, various designs of water stops or joint seals of rubber or sheet copper have long been used. Rubber seals harden and become brittle due to oxidation. An edge of either the rubber or copper seal, which protrudes into newly poured concrete, is easily knocked out of place during the pouring. This means shoveling away the concrete and straightening it, resulting in excess labor and material costs. A different-type seal was needed that would be easy and economical to install and would not have the disadvantages of conventional water stops.

Realizing the need for such a product, L. F. Harza, president of Harza Engineering Co., Chicago, Ill., developed the extruded water stop of Geon plastic which resists the alkalinity of concrete, and has superior aging properties.

The plastic joint seal, extruded by Perfex Plastics, Inc., Chicago, is a central rib backed by U-shaped grooves and weighs 2.02 pounds per foot. The uniformity characteristic of Geon is highly important in extrusions of this size. The finished seal is rolled into 100 foot strips which are cut to desired lengths by a saw or knife at the construction location. A typical pour at the Guayabo project is a horizontal block 50 feet square and five feet thick.

Rubber and copper seals must be joined by vulcanizing and brazing operations, respectively. These are time-consuming and costly. Joining or welding the thermoplastic vinyl strips is done at the installation site by merely applying sufficient heat to the loose ends with an electrically heated knife or gasoline torch, thus eliminating waste or short pieces.

Registration of Surveyors Sought in Wisconsin

Wisconsin's land surveyors banded together recently to seek legislation for the registration of all practicing surveyors. By requiring registration of all surveyors, the society hopes to eliminate errors in land descriptions and platting.

According to Henry A. Kallsen, civil engineering instructor at the University of Wisconsin and secretary of the society, anyone can presently practice surveying in Wisconsin, regardless of training or competence.

Robert M. Poss, Marinette city engineer, was elected president of the new Wisconsin Society of Land Surveyors. The society was formed by surveyors attending an Extension division engineering institute at the University of Wisconsin.

Elected vice president of the society was Richard B. Mecha, Manitowoc, a

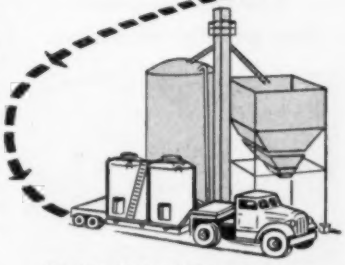
Hudson Builders' Material Co., Jersey City, N. J., save time and money moving bulk cement by using L.C.L. Air-Activated Containers mounted on La Crosse low bed trailers. Cement is *blown* from similar containers on railroad cars into trailer-mounted containers by compressed air . . . is automatically unloaded at plant same way. Each container holds 10 tons of bulk cement . . . is easily loaded in 10 minutes . . . unloaded in 6 minutes.

Besides saving up to $1.65 per ton by buying cement in bulk, Hudson Builders' also eliminate costly hand handling and improve working conditions with this *completely dust-free, all-weather method.*

Investigate the savings you can make by *mechanizing* your hauling and materials handling operations on job-proved La Crosse Trailers. Choice of standard or custom-built models—capacities from 6 to 67 tons.

A Cement is blown from cars to containers by compressed air.

B Trailer hauls containers ⅛ mi. to plant.



C Air "unloads" 10 tons of cement into storage silo in 6 minutes.

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☐ Rush complete information on La Crosse trailers:
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America's Favorite LOW BED TRAILER

Raymond C. Force

The death of Raymond Charles Force, first president of Caterpillar Tractor Co. and a member of its board of directors, occurred the 15th of November in Oakland, Calif.

Mr. Force laid the foundations for many basic policies which have guided Caterpillar's growth since it was founded in 1925. He served as the company's president until 1930, then became chairman of its executive committee and a member of the board. He served in the latter capacity until his death.

Mr. Force became associated with the track-type tractor business in 1919, when he was named vice president and secretary-treasurer of the C. L. Best Tractor Co., one of Caterpillar's two predecessor companies.

During 1940-41 he was chairman of the board of directors of the Federal Reserve Bank, San Francisco. He also was a member of the executive committee of the Bank of California, N. A., of San Francisco.

He served as president of the San Francisco Post of the Army Ordnance Association

Mr. Force was born July 28, 1880 in Croton, Mich. and was educated in the public schools of Lowell, Mich. He graduated in 1898 from Northern Indiana Normal School, Valparaiso. Shortly thereafter he went to Seattle to work with the North American Trade and Transportation Co. His career led him to Alaska for several years before he moved to California and affiliated with the Best Co.

He is survived by his wife, Florence Heilig Force of Blackhawk Ranch, Diablo, Calif. and by two sons and a daughter. A brother, Harold W. Force, lives in Oakland.

member of the Fey and Brenner engineering firm. The society's directors are O. O. Bergman, Sparta; Alex W. Ely, Dane county surveyor, Madison; and R. P. Boyd, consulting engineer and surveyor, Eau Claire. Purpose of the society is to "foster high standards of professional ethics and practice, and thus encourage public faith in and reliance on land surveyors."

Ask the men who live with wire rope...

They insist on genuine

CROSBY CLIPS

Drop-forged
Hot dip galvanized
SIZES FOR ALL WIRE ROPE
DISTRIBUTORS EVERYWHERE

AMERICAN HOIST & DERRICK CO.
ST. PAUL 1, MINNESOTA

Toll Trend Continues Spread

Continuing expansion of the trend toward financing superhighway construction through the toll system is indicated by reports from an increasing number of states.

A significant new milestone in the trend was marked by the partial opening in November of the New Jersey Turnpike, which, when fully completed early next year, will run 118 miles across the state from the George Washington Bridge to Deepwater. Early traffic attracted by the first section opened, the southern half, nearly equalled engineers' estimates for the entire route.

New York state voters at the November election overwhelmingly approved a state constitutional amendment placing the state's credit behind $500 billion in the bonds of the State Thruway Authority. This is to finance construction of the 535-mile New York-to-Buffalo thruway.

The authority, which hopes to have the superhighway project completed by 1954, estimates that the amendment will save $120 million in interest charges in its financing, since use of the state's credit will bring the interest rate down from 3¼ to about 2%. The bond issue will be amortized from tolls and other revenues from the project.

The Oklahoma Turnpike Authority is aiming for completion of the Oklahoma City-Tulsa toll superhighway by Dec. 1, 1952, at a total cost within the $31 million bonds issued.

Other toll road construction which has been in progress this year includes the $6,300,000 Denver-Boulder turnpike in Colorado, and the western extension of the Pennsylvania turnpike to the Ohio line. Preparations were being made for the issuance of $90,550,000 in revenue bonds to finance construction of an 86-mile toll superhighway in West Virginia, extending from Princeton, to Charleston.

Efforts are being made for a start

DREDGES

HYDRAULIC
DIPPER
CLAMSHELL

Bolted sectional steel hulls for landlocked, inland waters

If you need a dredge, write us!

AMERICAN STEEL DREDGE CO. INC.
FORT WAYNE 1 · INDIANA · U.S.A.

DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905

SAFETY
on the Job

Enjoy the satisfaction of knowing that you, too, have taken every safety precaution on your blasting jobs. You can remove many a hazard if you *"Hook Up and Detonate with PRIMACORD."*

Primacord cannot be set off by friction, sparks or ordinary shock — it requires a blasting cap. It is not affected by stray currents.

Safety is not the only reason you need Primacord. Its use means faster, easier loading; positive firing of every cartridge in the hole; better fragmentation in planned shots. It helps to keep your shovels digging with pay dirt in every load.

For further facts, ask your explosives supplier, or write direct

THE ENSIGN-BICKFORD COMPANY
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Also Safety Fuse since 1836

PLAIN PRIMACORD for shallow holes and surface trunk lines; **REINFORCED PRIMACORD** for deep holes and resistance to abrasion; **WIRE COUNTERED PRIMACORD** for deep ragged holes; **PLASTIC REINFORCED PRIMACORD** for deep, wet holes and river crossings.

Use PRIMACORD®
The PROVED and APPROVED DETONATING FUSE

Preferred power for sand and material spreaders and a wide range of other equipment for road maintenance and construction — the world's most widely used single-cylinder gasoline engine on machines, tools, appliances used by industry, railroads, oil-fields, and on equipment for farm and home.

BRIGGS & STRATTON is the world's largest builder — more than 30 years of continuous production — of single-cylinder, 4-cycle, air-cooled gasoline engines. Briggs & Stratton Corporation, Milwaukee 1, Wisconsin, U. S. A.

In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

next year on the construction of a 241-mile toll superhighway across northern Ohio. The cost is to be financed by a $300 million revenue bond issue of the Ohio Turnpike Authority.

Studies are being made in Florida of a proposed $100 million toll superhighway between Jacksonville and Miami. The studies, now in the preliminary stages, also contemplate construction of a leg extending from the East Coast to the Tampa Bay area. Although favored by Miami residents, the plan has drawn opposition from a number of other east coast communities, fearing loss of tourist trade if their communities were by-passed.

Governor Herman Talmadge has announced he will recommend to the 1952 Georgia legislature the establishment of a toll system to help finance the construction of superhighways. Toll financing, he said, would enable the state to complete a four-lane highway between the Tennessee line near Chattanooga and Atlanta. Gubernatorial interest in toll roads also has been evidenced in California. Gov. Earl Warren recently told a press conference that the plan might be worthy of consideration as a means of increasing highway revenue.

Up in Maine, the State Turnpike Authority has announced retirement of $181,000 worth of the $20 million revenue bond issue which financed construction of the 45-mile Kittery-to-Portland toll superhighway.

New laws authorizing the issuance of revenue bonds for toll road financing were enacted this year in Indiana and North Carolina, but no early construction plans have been reported from either state. Pennsylvania's legislature authorized extension of the Pennsylvania Turnpike to connect with the New Jersey Turnpike and also a northeastern extension to the New York state line. Pending legislation would authorize further extension of the Pennsylvania Turnpike from some point west of the Susquehanna River to a point near the Maryland-Pennsylvania border.

Bills proposing new or broadened authority for toll roads were rejected by the 1951 legislatures of Alabama, Arkansas, Delaware, Illinois, Michigan and Wisconsin, with such a measure still pending in Missouri.

Uncompleted Me. Airfield Becomes Naval Base

The Brunswick, Me. airfield, although still two or three years away from the completion stage, was recently redesignated as a naval air station. When finished this super jet base will take its place as one of the most im-

• A Bucyrus-Erie 38-B crane helps construct an underground trout stream at the naval air base extension at Brunswick, Me. About 2,600 feet of the river had to be placed underground. The sections of pipe behind the machine weigh about nine tons each.

portant naval installations on the entire East Coast.

Buildings are being added and runways extended on this base which also played its part during World War II. The entire underground system of steam pipes is being replaced and new water pipes have been laid. All of the buildings already in existence for which use has been planned have been completely renovated.

At the south end of the surveyed runways a trout stream posed a temporary problem since it could not be diverted in another direction. To get rid of this water the navy decided to put it underground. The contractor dug a trench 2,600 feet long and about 40 feet deep. A cement cradle was built at the bottom of the trench and onto this was laid triple pipe. The two outside pipes are 5 ft. by 6 in. diameter with the middle pipe measuring an even 6 feet. About 35 feet of earth will cover the underground stream.

NEWCO WIRE ROPE
CLAMP
AND THIMBLE

SIZES TO FIT WIRE ROPES FROM ¼" TO ⅞" IN DIAMETER

DEVELOPS 85 TO 90% OF ULTIMATE ROPE STRENGTH (95-100% CATALOG LIST)

THE HEAVIER THE LOAD THE TIGHTER IT HOLDS!

PAT. PEND.

The most efficient attachment for wire rope because of combined strength and design. Permanent castings, standard replaceable bolts and nuts. NO WRONG SIDE—threads either way. Easy to install in field or shop, and never needs lubricating.

See your distributor or write direct to

NEWMAN MFG. CO.
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SMOOTH, STEADY OPERATION of this ¾-yd. 22-B dragshovel is shown during finishing work on a large basement in Los Angeles, Calif.

SHOCK-RESISTING HARDNESS is given castings treated in this new, completely automatic heat-treat furnace. Such pre-assembly care pays off later in long machine life.

MODERN FOUNDRY METHODS are exemplified by this electric furnace in operation. In its own foundry Bucyrus-Erie has pioneered in the development of steels especially suited for excavating equipment.

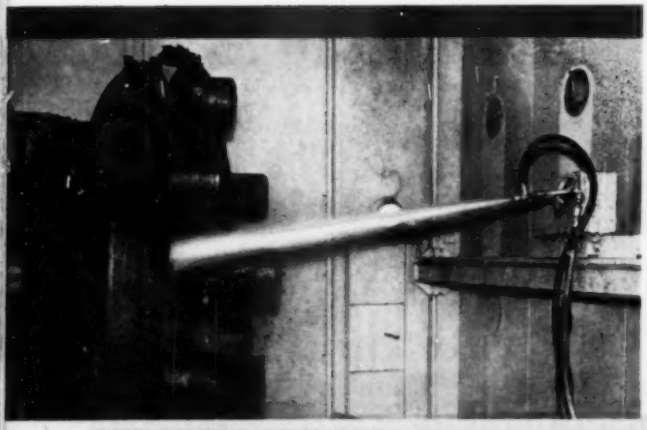
Here's Why You Buy Quality When You Buy Bucyrus

FOR 71 years the most-wanted excavator line in the contracting field—that's Bucyrus-Erie! Such year in, year out preference reflects the quality built into every Bucyrus-Erie machine — the result of the industry's largest full-time engineering staff, with an unmatched background of field experience, plus thorough laboratory tests of all materials. Such rigid manufacturing controls combine with careful field testing to produce a machine that **you know** will perform exactly as specified.

To a contractor engaged in the most extensive building program in America's history, this close attention to quality means that you'll have a machine that will take tough going in stride for many years to come . . . one that will offer fewer maintenance problems — produce higher output records with less downtime.

While heavy defense demands are in effect upon manufacturers of excavating equipment, it will pay you to see your Bucyrus-Erie distributor now for the delivery picture on this "quality proved" line of ⅜- to 4-yd. gasoline, diesel and single-motor electric excavators. They're worth waiting for!

307E51C



HIGH PRESSURE CLEANING of rough castings with sand-water-blasting equipment is but one of the high-grade casting-cleaning methods employed before precision machining.

Most Compared Most Preferred

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

"Let the shovel go . . . but hang on to that DIPPER"

When the preference for an Amsco Dipper is so strong that a superintendent at one of Minnesota's largest iron mines quietly removes it from a shovel being shipped to another mine, there are apt to be some good performance reasons why!

The superintendent reported that this AMSCO 6½ yard renewable lip dipper *loaded a record number of tons per 8 hour shift*—more than had ever been loaded before. And, where other dippers needed repairs every 2 months or so, it is still going strong after 6 months of service with no repairs of any kind!

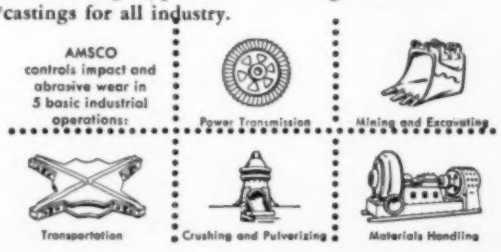
Better design and construction are the reasons for this high production and longer, uninterrupted service. The wide mouth and shallow depth permit faster, easier digging and loading, and a 4-way taper insures clean dumping every time.

And, this dipper is *all-cast*—of tough, work-hardening AMSCO Manganese Steel. The renewable lip and heel plate, when finally worn, are replaceable in a matter of minutes.

Dippers can—and should be—bought with an eye to higher digging efficiency and lower costs per ton . . . and the moral of this actual on-the-job example is clear . . .

WHEREVER YOU MEET A PROBLEM OF WEAR CAUSED BY IMPACT AND/OR ABRASION . . .

. . . find out about longer-lasting, dollar-saving Manganese Steel Dippers made by AMSCO . . . world's largest producer of manganese steel castings for all industry.



Brake Shoe **AMERICAN MANGANESE STEEL DIVISION**

373 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.
Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

NOT in the *Contract*

Latest model gas ranges include a Venetian blind in the glass oven doors. This is for bashful girls who cook rump roasts.

Mr. Kranz took one look at the household bills for the month, groaned audibly and reached for a headache powder. Mrs. Kranz regarded his antics with vast displeasure. "Let's have none of your small-time pantomime," she grumbled. "If you have something to say, shut up!"

"Your child's spoiled."

"He's not spoiled."

"Well, if you don't believe me just go out and look under that steam roller."

He was an American and she was French. He was in New York to buy furniture for his store in Tulsa. They met on an elevator. She looked good to him. He looked good to her. He took out a pad and pencil and drew a picture of a hansom with a question mark after it. She nodded yes. They went for a ride in the park. He drew a picture of a restaurant. She nodded yes. They ate. He drew a picture of some dancers. She nodded yes. They danced. Then she asked for the pencil and pad. He gave them to her. She drew a picture of a four-poster bed . . . now, what he is trying to figure out is how she knew he was in the furniture business.

Cop: "How did you knock this pedestrian down?"

Truck Driver: "I didn't. I just pulled up to him, stopped the truck to wait for him to pass, and he fainted."

The lady opened her refrigerator door and to her amazement saw a white rabbit comfortably seated inside. At a loss for what to say she stammered, "W-what are you doing in there?"

The rabbit replied "Madam, isn't this a Westinghouse?"

"Why, yes," the lady replied "but —"

"Well," said the rabbit, "I'm westing."

Sweet young wife: "Now over in this corner, we'll have a loveseat — over there, we'll have a loveseat, and here by the fireplace we'll have another loveseat."

Decorator: "My word, do you call this a living room?"

Young wife: "Why of course—if that isn't living, I don't know what is!"

The shoemaker was explaining to a complaining customer the reason for the poor quality of his soles. "All the good leather," he said, "is going into steaks."

He: Why do you weep and sniffle at a picture show over the imaginary woes of people you never met?"

She: "Same reason why you scream and yell when a man you don't know slides into second base."

The old-timer, looking bent, weary and dejected, hobbled painfully up to the bar.

"What's the trouble?" asked a bystander. "You look bad."

"It's yoorz," moaned the old-timer. "I've got a bad case of yoorz."

"What's yoorz?" asked the bystander.

"A double Scotch, thanks."

Serious Young Man: "Do you enjoy Kipling?"

Giddy Girl: "I don't know—how do you kipple?"

"Daddy, my teacher wants me to prove that the white man is superior to the Indian," said Johnny. "Can you help me?"

"Don't think so," replied Daddy. "When the white man took over the country the Indians were running it. There were no taxes. The women did all the work. How could they improve on a system like that?"

"A smart-aleck kid rolled a snowball in front of me a couple miles back."

Equipment You Ought to Know About

Dual Drum Paver

Manufacturer: Worthington Pump and Machinery Corp., Dunellen, N. J.

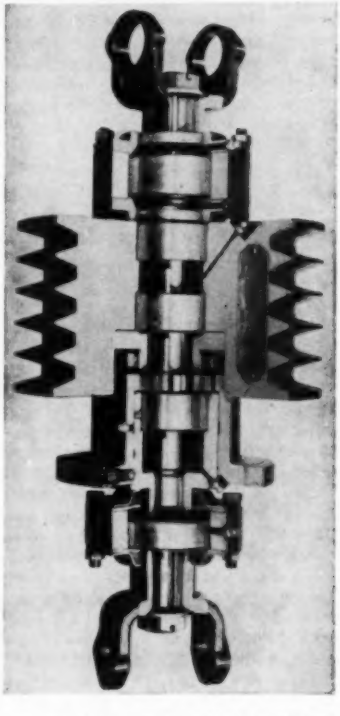
Claims: Designed with ultra high speed operating cycles, the paver is manufactured to meet modern paving conditions. Typical of the speed claimed for the new Model WP paver is a boom bucket travel rate of 256 fpm. The power loader skip requires only 6½ seconds to travel from the ground to discharge position of 56° low slope. Transfer from the first to the second mixing compartment also requires about 6½ seconds, depending upon consistency of the concrete. Discharge into the boom bucket is another 6½ second operation. Boom swing is a full 171°.

The paver retains the exclusive hydraulic bucket, permitting complete control of rate of concrete discharge under all conditions. Increased braking area, more efficient boom raising and lowering machinery, a redesigned drum, and new crawlers and frames are other features of the new machine.

Power Take-off

Manufacturer: Davey Compressor Co., Kent, Ohio.

Claims: A new "packaged" heavy duty power take-off to fit all standard motor trucks is known as the P-80. The take-off is guaranteed to transmit full engine power to the driving of heavy duty truck-mounted equipment. It contains 12 less parts than its predecessor model, "Davey 75," and is 25 lbs. lighter. Another new feature is a



vacuum shift control which is offered as optional equipment. The take-off unit itself is identical for all trucks. Carefully engineered mounting parts for individual truck makes are maintained in stock at all times. Due to design simplification, it is estimated that take-off installation time has been reduced by 50%.

The P-80 is 18 inches long and weighs 140 lbs.

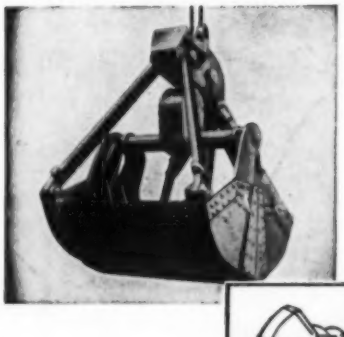
Snow-Melting Chemical

Manufacturer: Speco, Inc., 7308 Associate Ave., Cleveland 9, O.

Claims: Ice Rem, ice and snow-melting chemical crystals possess a thawing capacity 30 times greater than that of salt. Sprinkled on the exposed surface at the beginning of a snow or sleet

Continued on page 62

ERIE *Barge Type* Bucket



In this type the large deck area achieved means bigger payloads in stock piling and barge rehandling work. Erie's booklet on 2-line buckets gives you complete data on this type and 3 other classes of Erie Buckets. Write for copy today.

***Compare* DECK AREA**

¼ Yd.	27.21 Sq. ft.
½ Yd.	30. Sq. ft.
1½ Yd.	32.3 Sq. ft.
1½ Yd.	38.7 Sq. ft.
1¾ Yd.	42.4 Sq. ft.
2 Yd.	45.1 Sq. ft.
2½ Yd.	53.5 Sq. ft.
2½ Yd.	57.6 Sq. ft.
3 Yd.	60.9 Sq. ft.

Write for Catalog* 2L-2 *Today

ERIE STEEL CONSTRUCTION COMPANY

4211 GEIST ROAD • ERIE, PENNSYLVANIA

NEW JERSEY TURNPIKE — loose sand footing doesn't stop four-wheel-drive.

HOLLAND TUNNEL pavement removal demands precise control, plus power.

PAYLOADER®

Versatility Pays Off

WHETHER on the New Jersey Turnpike construction or Holland Tunnel repaving, the combination of four-wheel-drive, large pneumatic tires and *power* of this big, compact 1½-yd. "PAYLOADER" tractor-shovel pays off. It has fast-action traction on all kinds of footing — crawler-like traction at far less maintenance expense — PLUS speed when you want it. It has *versatility* to work on sand, mud, snow or clay and to travel over streets and highways at 16 mph.

This "PAYLOADER" also gives you easy operation and maneuvering speed with power-boosted steering and four speeds in reverse as well as forward . . . and is available with gasoline *or* diesel power. Hundreds of contractors are enthusiastic owners and boosters and once you've seen an HM in action you'll understand why. You'll find them on all kinds of construction projects from turnpikes to tunnels. The Frank G. Hough Co., 708 Sunnyside Ave., Libertyville, Illinois.

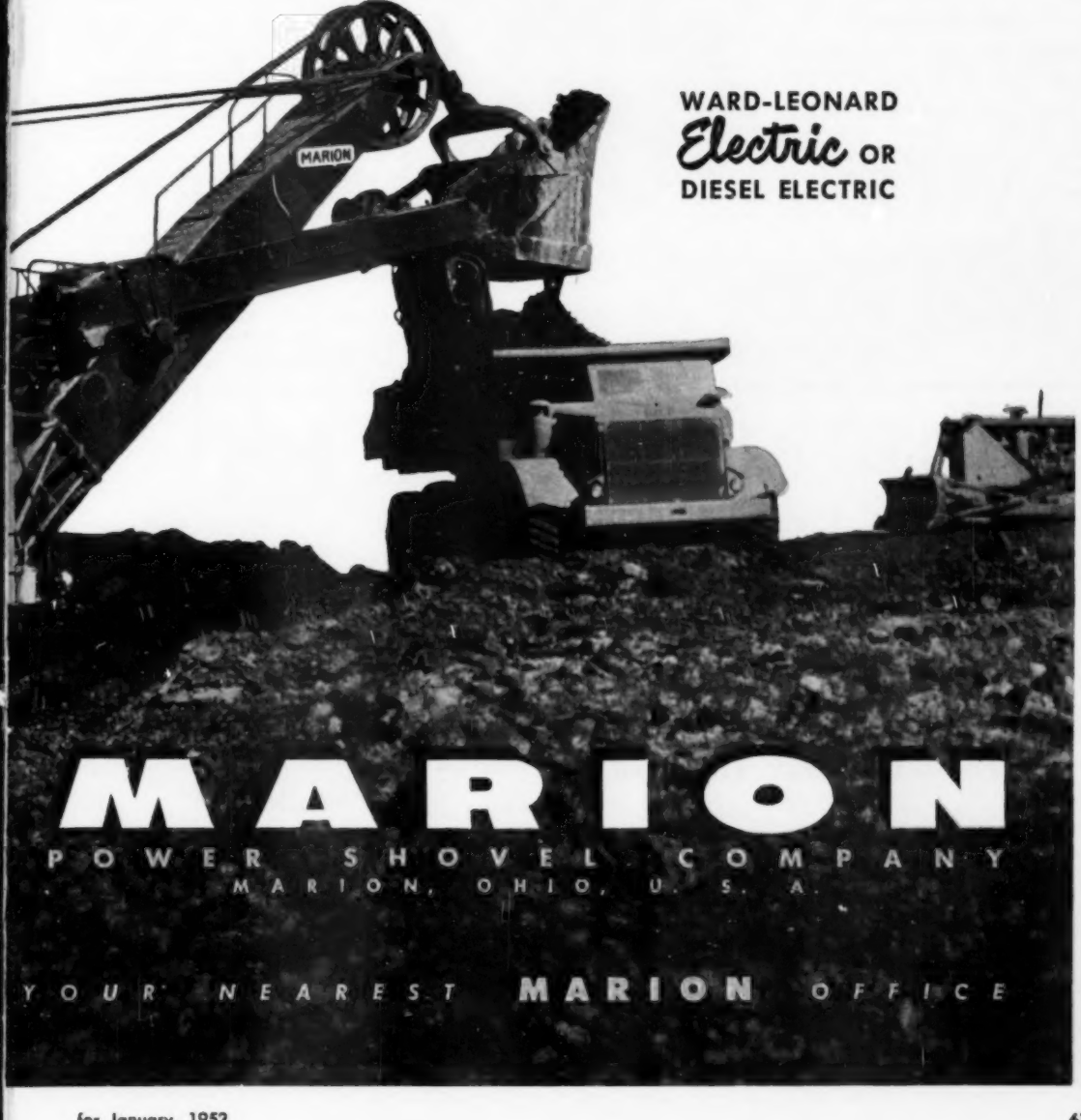
WRITE for full information on the Model HM or other "PAYLOADERS." There are seven sizes from 12 cu. ft. to 1½ cu. yd. capacity.

NEW
MARION
191-M
WESTERN
CONTRACTING
CORPORATION
GET THE DETAILS FROM

MARION 191-M • 10 cu. yds.

World's Biggest Shovel For

LOADING BIG HAULAGE UNITS



WARD-LEONARD
Electric OR
DIESEL ELECTRIC

MARION

POWER SHOVEL COMPANY
MARION, OHIO, U. S. A.

YOUR NEAREST **MARION** OFFICE

New Equipment

Continued from page 58

storm, it melts snow on sidewalks, driveways, loading docks, streets, parking lots—or any other area—during that and subsequent snows until its exothermic action is exhausted.

The chemical "spreads itself" and leaves no messy residue. It will not harm tires, shoes, asphalt surfaces or concrete.

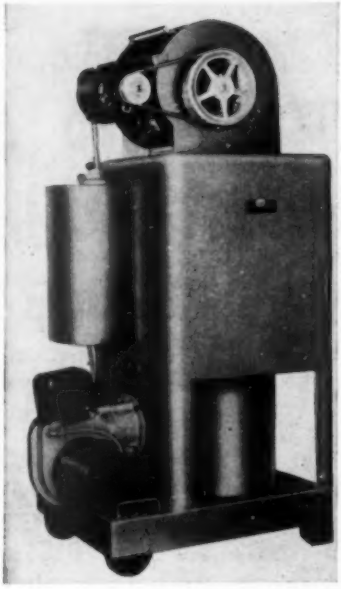
Ice Rem is available in 10-lb. cans, 25-lb. pails and 100-lb. fiber drums. Ton lots are shipped in waterproof 100-lb. bags.

Heat Machine

Manufacturer: Fageol Heat Machine Co., 5725 Mt. Elliott Ave., Detroit 11, Mich.

Claims: This new 140,000 B.T.U. heat machine for indoor or outdoor use is known as Model PW-140. The machine is reputed to employ a new principle of forced-air circulation and to "heat men at work—not empty spaces."

The manufacturer states that, by blowing warm air out of the machine's base along the floor, it creates a 6-foot-high heat blanket and eliminates the necessity for heating vast overhead areas in order to keep workers comfortably warm. This concentration of heat is said to reduce heating costs by as much as 90%.



The Model PW-140 sprays heat from all sides across the floor and can be advantageously located in the center of large areas. The Model PW-140 is designed to comfortably heat workers in areas up to 3,000 square feet of confined space or 1,600 square feet of open space. A 200,000 B.T.U. model known as PW-200 is also available.

These machines burn regular furnace type fuel oil of No. 3 or lighter grades or kerosene. Model PW-140 requires no flue or chimney. Self-contained, it has an attached 6-gallon fuel tank and is equipped with wheels for easy portability as a hand truck. Dimensions are 21x33x58 inches high. The machine weighs 245 pounds. Burner is UL-approved gun type, pressure atomizing. The machine can be started or stopped by snapping a switch.

Heat machine uses, recommended by the manufacturer, include heating factory or warehouse buildings; heating individual working areas in large buildings; heating men, equipment, work shacks, frozen ground, etc., on construction jobs or mining locations; drying agricultural products; drying plaster, cement, etc.; heating airplane hangars; heating garages or repair shops with large, frequently-opened doors.

Roadmixer

Manufacturer: Wood Manufacturing Co., North Hollywood, Calif.

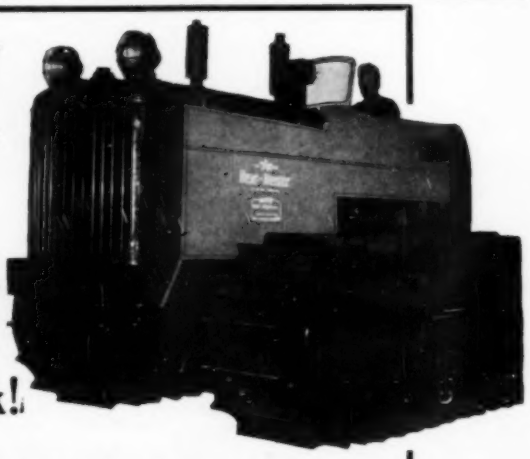
Claims: The Model 42 Roadmixer is

Increased **EFFICIENCY**
For Operator and Equipment

with the
genuine

Heat-Houser

Keep Warm While You Work!



Heavy duty, waterproof canvas tailored for a tight fit and designed for ful-vue vision and plenty of operator room offers protection during those chilly operating days.

Adjustable heat control — streamlined and simple to install on your equipment, HEAT-HOUSER increases the operating efficiency of equipment and protects equipment from rain, snow, sleet and mud. Write for complete details. Sales and Service from Coast to Coast.

FORT DODGE TENT & AWNING COMPANY
INDUSTRIAL DIVISION
FORT DODGE, IOWA

now powered by an IHC-UD18A rated at 125 hp at 1,600 rpm. The previous power plant delivered 100 hp at 1,800 rpm. According to company officials, the additional torque power of this new engine produces an ultimate increase of approximately ⅓ more power.

The Model 42 is self-powered and self-propelled with mixing capacity up to 200 tph. It is one of three complete traveling mixing plants built by Wood. The other two units are the Model 54, tractor-drawn and powered with capacity up to 350 tph, and the Model 36, self-powered and self-propelled, with capacity up to 150 tph. All three units are used for asphaltic and soil-cement surfacing or re-surfacing, and base course stabilization.

Back-Rippers

Manufacturer: Preco Inc., 6300 E. Slauson Ave., Los Angeles 22, Calif.

Claims: The back-rippers mount on the back of bulldozer moldboards and rip only when the tractor backs up and are now available for angling blade bulldozers.

The four back-ripper housings are welded to the under side of the "C" frame on angling blade bulldozers, permitting their use irrespective of the angle of the blade itself. The teeth float on top of the ground when the tractor moves forward, and automatically dig and rip when the tractor backs up. Thus the lost back-up time becomes a

profitable operation and still enables the blade to make a full load on each forward trip. When desired, the teeth can be locked up out of the way. Rocks, roots, shale and other material impossible to blade out easily are ripped out with a single back up pass by the back-rippers.

You Need All 12 For Extra Life... You Get All 12 In Red Arch Buckets

1. **Alloy Steel Body** Strong steel plates are continuously welded to steel corner sections.
2. **Direct-to-Lip Drag** Lips extend forward to drag clevis hitch plates. Drag is direct, not through body to lip.
3. **Integral Hitch Pin Bearing** Riveted to both arch and lip for greatest possible strength.
4. **Sturdy Box-Type Arch** Provides maximum strength with minimum weight.
5. **Alloy Cast Steel Drag Clevis** Clevises are designed as reversible units to provide two different drag hitch connections.
6. **Single Pin Drag Unit** Remove one pin — disassemble drag rope socket from drag chain and drag rope.
7. **Self-Cleaning Hoist Trunnions** Provide free passage of dirt for minimum wear.
8. **Alloy Steel Spreader Bar and Chains** Heat-treated from end to end for extra wear.
9. **Rigid Sheave Frame** Reinforcing webs in back keep it rigid.
10. **Heavy-Duty Runner Bars and Renewable Heel Plates** Provide extra strength and wear-ability.
11. **Reinforced Back Edge** Channel section provides strong reinforcement across bucket back.
12. **Tiger Teeth** Made of forged tool steel, easy to insert, remove and resharpen.

33RS1C

BUCYRUS ERIE

South Milwaukee, Wisconsin

GET the full story on faster loading, smoother carrying, quicker dumping Red Arch buckets. Sizes ½ to 30 yards. Write for details.

EX-LAFFS

By Marvin Townsend

"I sure fooled those guys. They said I'd be blown someplace besides here if I got careless."

"You could use it for a tool shed."

"Better mix a little faster, Gus, we're almost there."

"Could we put it up for a few days? We're having trouble hiring men for the building project across the street."

"Okay, boss. Let 'er go."

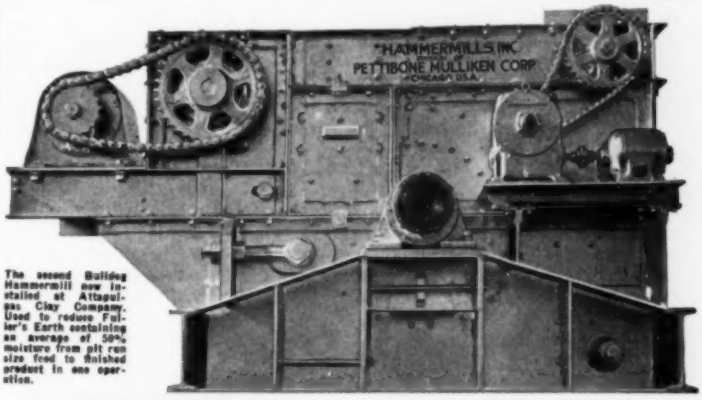
New trade literature

Title: **Portable Material Elevator Catalog**
Subject: A larger, stronger platform and new method of hooking the platform or concrete bucket to traveling carriage is described. Assembly of the elevator has been speeded by using pins wherever practical, new type tower section splices and a new single unit tower head. The concrete bucket tripping device is attached to tower and can be set for any desired dumping height in a matter of minutes. Adding extra tower sections above the standard elevator height is simplified with a new tower erection device—this method is illustrated and described step by step in the 8-page catalog.
Where to get: American Hoist & Derrick Co., St. Paul 1, Minn. (Catalog 250-E-1)

Title: **Earth Drill**
Subject: A folder describing the features of the new Calweld earth drill, Model 150A, has been issued. Pictures, sketches and diagrams show the operation of this mechanical drilling machine as it digs caisson pier holes, pre-bores concrete piles, drills water wells and cesspools, explores mineral deposits and tests soil conditions. Text gives specifications and explains the various usages of the earth drill in heavy duty construction, mining and oil field work.
Where to get: California Welding and Blacksmith Shop, Inc., Los Angeles, Calif. (Free)

Title: **Hardsurfacing Rod Selection**
Subject: This guide breaks down into basic operations, the parts that can and should be hardfaced for longer life. The fields are agriculture, materials working, mining and excavating, crushing and pulverizing, materials handling and power transmission. The name of the part is given as well as the recommended rod, sizes and method of application. It also contains a description of the rods in the Amsco line.
Where to get: American Manganese Steel Div., Chicago Heights, Ill. (Bulletin SG)

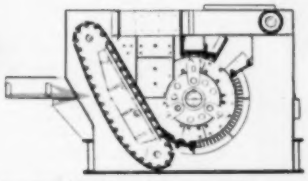
Title: **Soil Compaction**
Subject: Detailed information, including useful new production data, for figuring work schedules and costs on soil compaction jobs is contained in this new bulletin. It covers the use of the Barco portable gasoline "Rammer" for tamping fill or back-fill



The second Bulldog Hammermill now installed at Attapulgus Clay Company. Used to reduce Fuller's Earth containing an average of 50% moisture from pit run size feed to finished product in one operation.

Bulldog Hammermill

with Moving Breaker Plate



For wet, sticky material reduction . . . for those tough, heavy-duty crushing jobs.

Illustrated above is the last word in Moving Breaker Plate Hammermill design. It is built by an engineering organization whose experience far surpasses any organization that might furnish Moving Breaker Plate crushing equipment.
Design Improvements have increased reduction efficiencies and lowered H.P. requirements. You can see this equipment in operation at any time. Also Hammermills will gladly survey your reduction requirements and recommend the proper equipment without cost or obligation. Just write or call.

Bulldog Hammermills are built in capacities up to 1000 tons per hour for every purpose: for primary, secondary, fine reduction of materials such as limestone, shale, Fuller's Earth, phosphate muck, phosphate mud balls, iron ore, oyster or clam shells, any reducible material.

HAMMERMILLS, INC., Division of **PETTIBONE MULLIKEN CORP.**
4802 W. Division St. Chicago 51, Illinois Phone SPaulding 2-9300

HAYWARD
WON'T QUIT OR CAUSE TIME OUT
A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.
THE HAYWARD CO.
52-54 Church Street
New York, N. Y.
BUCKETS

in areas not accessible to heavy equipment. Of special interest to builders, contractors, supervisory engineers, and project managers is a discussion of the use of "soil compaction" as a means of attaining (1) greater permanence, (2) lower costs and (3) earlier completion dates on many construction projects. Applications described in the new bulletin include use of high degree soil compaction in construction work on highways, roads, streets, buildings, dams, bridges, airports, landing strips, ordnance proving grounds, pipe lines, utility trenches, parks and cemeteries.

Where to get: Barco Manufacturing Co., Dept. R-30, 1801 Winnemac Ave., Chicago 40, Ill. (Bulletin No. 621—Free)

Title: **Hydraulic Jacks**

Subject: Information, including specifications and application data, on hydraulic jacks, is offered in this 8-page letter-file size folder, known as hydraulic 51-R. It contains photographs, detail drawings and tabulated data on hydraulic equipment in capacities of from 10 to 100 tons. Simplex Re-Mo-Trol pumps and rams are featured, including a full listing of accessories and attachments. Other jacks shown are Simplex-Jenny hydraulic pullers, standard hydraulic jacks and the new Simplex Rol-Toe foot lift hydraulic jacks. All of this equipment is of particular interest to construction men, industrial plants, oil fields, ship builders, railways, mines and utilities.

Where to get: Templeton, Kenly and Co., 1020 S. Central Ave., Chicago 44, Ill. (Bulletin No. 51-R)

Title: **Anti-Rust Paint**

Subject: A new application bulletin describes how this paint can be applied on rusted surfaces without wire-brushing, scraping or sandblasting and retards further rusting action. It is available in black, aluminum and clear and can be applied by brush, dip or spray methods, indoors or out.

Where to get: Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, O. (Bulletin 136-11—Free)

Title: **Supervisory Training Film**

Subject: A new sound filmstrip and record program for supervisory training in industry and schools entitled "Straight from the Horse's Mouth," has just been produced. The program, which can be shown on any sound slide equipment, concerns itself with motivation, or how supervision can get employees to do what management wants them to do. The publishers state that this is the first film in the planned series entitled "Skill in Handling People." This is a result of actual field research and answers to questionnaires circulated to industry. The program includes the film and record, a conference leader's outline and 25 illustrative pamphlets so that viewers may more easily follow and retain the information presented.

Where to get: National Foremen's Institute, Inc., New London, Conn. ($69.50)

Title: **Photo Trip Thru Hobart Bros.**

Subject: A 40-page photo booklet shows the production of welding and electrical facilities and production equipment in the manufacturer's Troy, O., plant, is now being released.

Where to get: Hobart Bros. Co., Hobart Square, Troy, O.

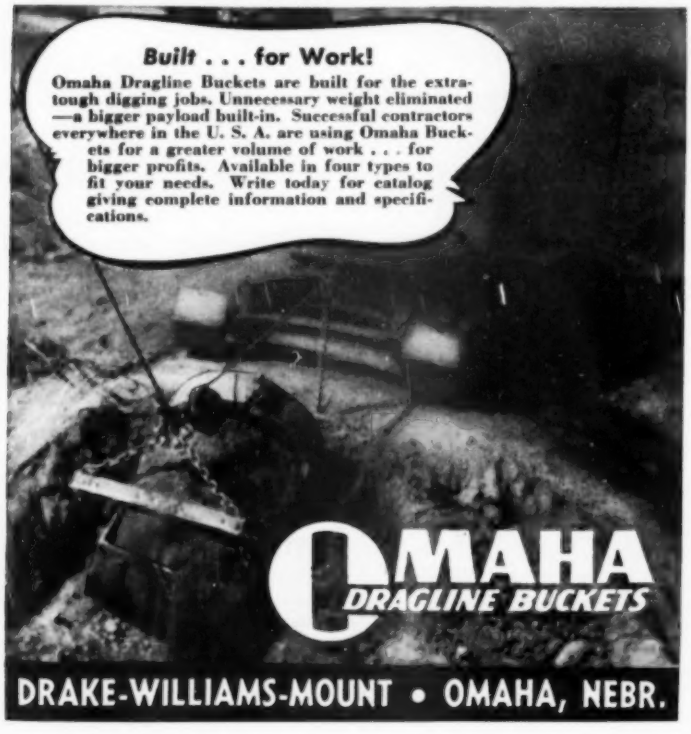
Title: **Uses of Diesels**

Subject: A booklet entitled "What Do GM Diesels Do?" describes the many uses Diesel engines fulfill in our modern economy. This booklet is written in rhyme and illustrated by drawings of locomotives, buses, boats, power shovels, saw mills and many other pieces of equipment that are powered by Diesel engines.

Where to get: Detroit Diesel Engine Div., GMC, Detroit 28, Mich. (Free)

Title: **Roller Compaction**

Subject: Bulletin 42 contains a paper by M. N. Sinacori of the New York state department of Public Works on the compaction of unstable material with a heavy, pneumatic-tired roller, and "Some Comments on Earth Compaction" by D. P. Krynine of the University of California. Sinacori explains the experimental use of a pneumatic-tired roller to compact refuse fill for an arterial project in New York. The roller can be varied in weight from 12 tons (empty) to 50 tons (filled with sandbags). It was found that the 50-ton roller tended to bog down in the soft fill. Best rolling results were obtained when the area was rolled in two stages: first stage requiring no more than 8 passes with roller weighing 30 tons; second stage requiring up to 30 passes with roller weighing 50 tons. Sinacori's paper also includes a set of recommended tentative specifications for special embankment foundation rolling. In his paper on earth compaction, Dr.


Built . . . for Work!
Omaha Dragline Buckets are built for the extra-tough digging jobs. Unnecessary weight eliminated —a bigger payload built-in. Successful contractors everywhere in the U. S. A. are using Omaha Buckets for a greater volume of work . . . for bigger profits. Available in four types to fit your needs. Write today for catalog giving complete information and specifications.
OMAHA
DRAGLINE BUCKETS
DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

Krynine examines compaction terminology and proposes certain revisions in the terms used. He particularly calls attention to the different types of tamping rollers, often grouped together as "sheepsfoot" rollers, and points out the sheepsfoot is only one type of tamping roller. Dr. Krynine also gives examples of how to choose between the dry and the wet side of the optimum moisture content.

Where to get: Highway Research Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C. (60c)

Title: **Euclid Films**

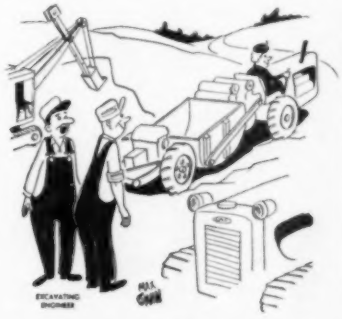
Subject: Two new 16 m.m. color sound films have just been released and are now available for showing to interested groups. "More Power to You," a 10 minute film, shows the Twin Power scraper at work on coal stockpiling and reclamation. This unit is a comparatively new development that has been used to good advantage on industrial, mining and contracting jobs. "What's Behind the Euclid Name?" is a 20 minute film that shows the development of earth moving equipment from the early days to the present. It also shows some "behind the scenes" views of the manufacturing processes, and job applications of several different types of equipment.

Where to get: Euclid Road Machinery Co., Cleveland 17, O. (Free)

Title: **Eimco Rockershovels**

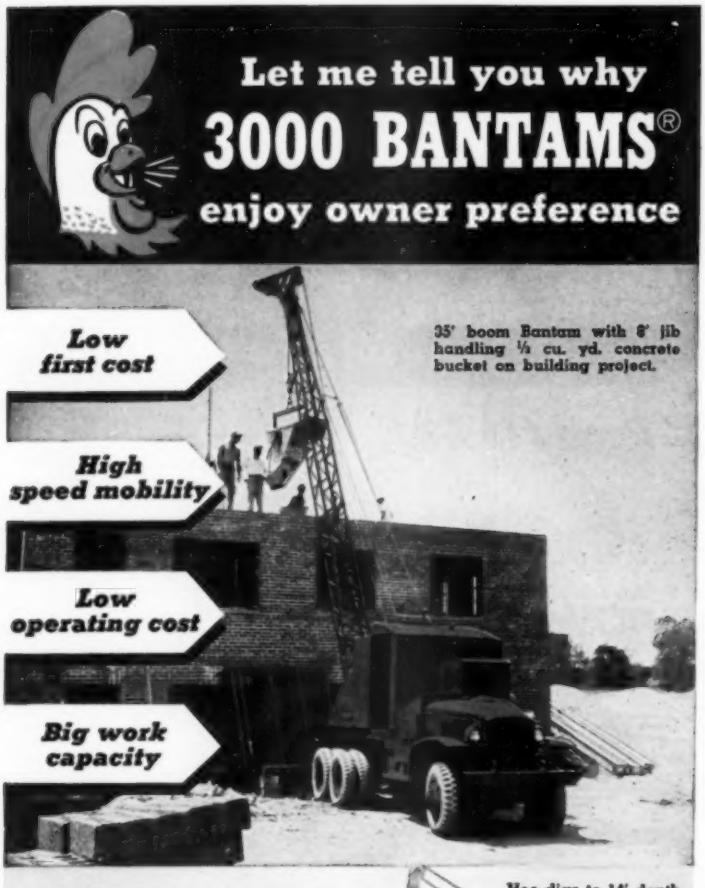
Subject: This new bulletin (L 1028) describes highway cleanup work which can be done by the Eimco 104. These illustrations show the machine removing rock and other debris spilled along the highways by rock slides and winter sluff.

Where to get: Eimco Corp., Salt Lake City 10, Utah. (Free)



"That's my wife. She has to pick up a few things in town."

IN ONLY
5
"QUICK" MINUTES
IT'S
Powered by Customers' Tractor-mounted Winch.
DETACHED, LOADED & RE-ATTACHED
Ready to GO!
ROGERS
POWER LIFT
DETACHABLE GOOSENECK
TRAILER
PATENTS PENDING
Frame is lowered to ground without need of blocking. Maximum height of 16" assures rapid, safe loading of equipment.
Complete Literature available upon request — Any Rogers Dealer will demonstrate its features right on your desk, with an OPERATING SCALE MODEL.
DEVELOPED BY
The Trailer Pioneers
ROGERS BROS. CORP.
ALBION, PENNA.
136 ORCHARD STREET
RAISES ITS DECK TO CLEAR HIGH BANKED CROSSINGS
STOOPS TO CLEAR LOW OVERHEAD OBSTRUCTIONS
CARRIES HEAVIER LOADS MORE PROFITABLY ON LARGER TIRES
Also of timely interest is this ROGERS Tag-A-Long trailer which makes a dump truck serve as a tractor and effects sizeable savings for contractors.


Let me tell you why
3000 BANTAMS®
enjoy owner preference
Low first cost
High speed mobility
Low operating cost
Big work capacity
35' boom Bantam with 8' jib handling ½ cu. yd. concrete bucket on building project.

Bantam costs only a fraction of the price of bigger machines . . . goes anywhere in a hurry!

Thousands of satisfied Bantam owners will tell you no other machine at any price can match the speed and economy of a truck-mounted Bantam, for handling scattered or intermittent jobs . . . and even for production excavating and lifting, where frequent job moves are required. Mobile Bantam easily handles up to 10,000 lbs. . . . works with 50' boom . . . digs 100' of 5' trench per hr. as back hoe . . . loads up to 90 cu. yds. per hr.

as shovel or dragline . . . can be equipped with low-cost magnet, clamshell, grapple, or 1400 to 2400 lb. pile driver for extra utility. See your Bantam Distributor for "on-the-job" proof, or write Schield Bantam Co., 202 Park St., Waverly, Iowa.

SB-CR-3

SCHIELD BANTAM

Cranes • Excavators

Get more jobs done at less cost

Notes from the manufacturers

Fuller Manufacturing Co., Kalamazoo, Mich. has completed a new 56,000 square-foot manufacturing building to be devoted to "small, miscellaneous transmission parts." The new manufacturing plant is the third facility erected within the last year on the 25-acre tract acquired in mid-1950. The new manufacturing building will house machine lines for such small parts as bearing covers, shift yokes, gear shift and hand brake levers, clutch throw-out yokes, bearing carriers and shift bar housings for heavy-duty transmissions. This addition will permit the company to devote facilities of the present main plant entirely to the production of gears, shafts, cases and clutch housings, and to the final assembly of transmissions. In addition to the 25-acre tract which is the site of the three new buildings, the company also has purchased an adjoining 25 acres. City water, sanitary sewers and all other industrial facilities are available. To match the increased production capacity of the transmission division, equipment expansions also are underway at the foundry department, in Kalamazoo, and the Unit Drop Forge division, in Milwaukee.

Mack Motor Truck Corp., NYC, has announced the appointment of E. M. Young as manager of the Charlotte, N. C., district. Young has been assistant to the manager of the truck company's Southern Division, Atlanta, Ga., since 1944. He joined Mack in 1924 as an assistant cashier at Knoxville, Tenn. Before locating at Atlanta, he served the company

"I think it needs a pinch of gravel."

in its Miami, Nashville and Charlotte offices. Replacing Young as assistant to the Southern Division manager at Atlanta is John Steinhauer who has been a salesman in the company's Atlanta territory since 1949.

Eutectic Welding Alloys Corp., NYC, has completed the construction of a new wing to house two new research laboratories. The new building will contain a special staff of research chemists and physicists who will concentrate on the development of new welding alloys utilizing fewer critical metals in today's shortage-burdened market. Research on new metals, such as titanium joining, is also included among the projects scheduled for this group.

C. H. Wheeler Mfg. Co., Philadelphia 32, Pa., has announced their consolidation with the Economy Pump division of Hamilton-Thomas Corp., Hamilton, O.—another division of the corporation. Production, engineering and sales departments of Economy are being moved from Hamilton to the Philadelphia plant. Economy Pumps will now be known as Wheeler-Economy Pumps. The consolidation will result in a considerable expansion and modernization of the Philadelphia plant.

Harnischfeger Corp., Milwaukee, Wis., has announced the appointment of George W. Hoskins as sales manager of its large excavator division in Milwaukee. He replaces Paul H. Hunter, recently transferred to P&H's San Francisco branch. Hoskins first joined Harnischfeger in April 1937, as a welding engineer in the Philadelphia territory. In May 1945, he became district manager of the Philadelphia office. He held the post until his transfer to Milwaukee. In his new capacity, Hoskins will have charge of sales for all large excavators. This includes friction machines which start at 2½ cu. yd. capacity and range upwards, as well as the large electric shovels used in open pit mining and quarrying.

Motorola, Chicago, Ill., has offered to replace free of charge any Motorola crystal of the sealed "D" and "E" type used in company's F.M. 2-way mobile radio equipment which fails to give satisfactory service anytime within three years. This warranty is not only in effect on current shipments but covers all "D" and "E" oven-type crystals now in use. This guarantee is made because the company believes that frequency stability of a transmitter and receiver is one of the most important items in full channel utilization with 100% modulation. This insures the best signal-to-noise ratio and prohibits interference with adjacent channels. By offering this warranty, the company can be sure that equipment is maintained at maximum operating efficiency. The warranty is applied to the quartz crystal unit in the oven type assemblies and excepts the thermostat and heater elements.

Cummins Engine Co., Inc., Columbus, Ind., announces that R. P. Parshall, former manager of the Milwaukee branch, diesel sales corporation, Chicago, has joined the regional organization, as regional manager, southeastern region, with headquarters at Atlanta, Ga. Parshall has been associated with Cummins diesel sales corporation for the past five years, the last two of which, he has been manager of the Milwaukee branch. A graduate of the University of Illinois, he served in the U. S. Navy for three years during World

SAUERMAN SCRAPER

CRAWLER DRAGLINE AND SCRAPER

Here is a Crescent scraper rigged with crawler dragline to convert the dragline into a slackline unit that reaches several hundred feet and moves gravel from river onto bank.

SCRAPER STOCKPILING

A concrete construction project required storage of a large tonnage of aggregate on ground between railroad and mixing plant. Two Sauerman scraper machines, one of which appears in picture, stored and reclaimed 2,000 tons of material a day.

In a Sauerman Power Drag Scraper you find a profitable combination of digging power, haulage speed, long reach, simple operation and economical maintenance. It cuts costs to the bone on jobs of digging and hauling earth or bulk materials distances from 100 ft. to 1,000 ft. or more.

A Sauerman machine is particularly useful where ground conditions are difficult. It gives good results on such diverse work as the excavation of hard-packed gravel, movement of sticky clay, handling of waste material, bulk material stockpiling, removal of sludge from settling ponds and so forth. In digging from a high hill it overcomes the hazards of caving walls.

The operator of a Sauerman machine has finger-tip control of the entire operation. Automatic shifting of the tail end of the machine is provided where desired. Any workman is readily trained as an operator. Power requirement is moderate. Installation and upkeep costs are surprisingly low.

Write for the new 24-page Sauerman Scraper Catalog and tell us about your material handling problems.

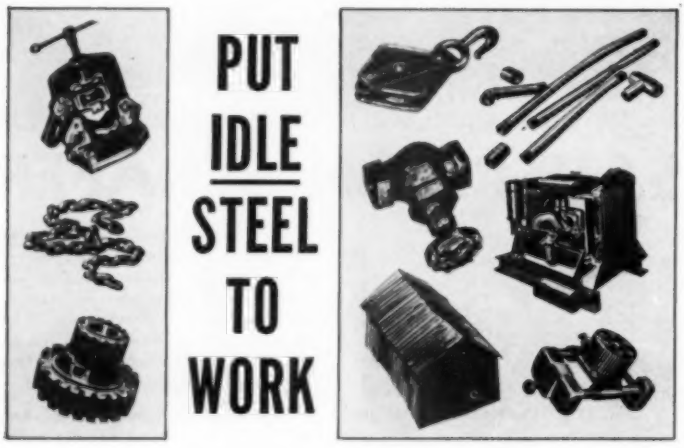
Sauerman Bros., Inc.

574 S. CLINTON ST., CHICAGO 7, ILL.

War II. W. G. Turner, former regional manager, southeastern region, with headquarters at Atlanta, has been transferred to Cleveland as regional manager, Great Lakes area. Turner was appointed manager of the southeastern region in March, 1948. Previously, he served as assistant regional manager in New York city. He joined the company sales force in June, 1947. Turner is a graduate of Kenyon College, Gambier, O., and a navy veteran of World War II. R. F. Davis, former assistant regional manager, central region, with headquarters at Chicago, has been promoted to regional manager, eastern region, with offices in the Chrysler Building, New York city. Davis has been with the company since 1942. He first served as an inspector on the production line. In 1944 he was transferred to the purchasing department, where he became a field expediter. In September, 1947, Davis became manager of engine sales, and held this post until November, 1948 when he joined the regional organization.

Bucyrus-Erie Co., South Milwaukee, Wis., has opened a new western headquarters at 120 Freeway St., South San Francisco, Calif. The new, larger location, necessary to provide greater service facilities for customers, includes modern sales offices and expanded warehouse and yard storage space. A larger inventory of tractor equipment units also will be possible because of the additional space. Sales and service personnel covering the excavator division are J. H. Sackett, western sales manager, H. L. Livingston, sales representative, H. E. Lowe, sales representative, and A. O. Belding, service engineer. Sales and service personnel covering the tractor equipment division are H. R. Langford, district representative, John Plehn, John Carlile, and W. O. Blattner, sales representatives and Ralph Bickers, L. L. Brown and R. E. Jephson, service engineers. Western contractors will find them even better equipped to assist with information and advice on excavating problems and equipment than in the past. The telephone number is Juniper 7-0670.

Barber-Greene Co., Aurora, Ill., announces several major changes in the sales organization. W. B. Holder, formerly general sales manager, will head up a new division of the company, plans for which are now being formulated, details to be announced later. E. H. Holt will become general sales manager, responsible for overall sales policy and in direct supervision of the Aurora and domestic sales organization. J. D. Turner, becoming director of publicity and promotion, will supervise publicity and advertising and, in addition, will work closely with Holt. Working for the New Mexico department of highways during his high school summer vacations started the construction career of E. H. Holt. He received his B.S. degree in Civil Engineering in 1939, from the University of Illinois. Almost immediately after graduation, he came with Barber-Greene as a field engineer starting new equipment, trouble shooting, working with experimental models in the field, etc. During World War II he was assigned to the Office of Chief of Engineers in the research and development branch. Holt was later assigned to the 1880th engineer aviation battalion which did construction work in this country, North Africa, India and Burma. This battalion helped construct the famous Stillwell or Ledo Road, and later undertook the maintenance of the Burma Road. After discharge from the service, he became area manager with headquarters in Washington. A little over a year ago he was called to Aurora to become eastern division sales manager. J. D. Turner started in the Barber-Greene shop in 1925. In 1927, he moved to the advertising department specializing on job stories about B-G machines. Two years later he became advertising manager. He was made director of publicity in 1945, and created a sales training course, which has been attended by over 800 salesmen from the U. S. and many foreign



. . . to make NEW steel

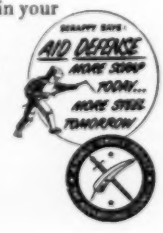
Steel mills use *one* ton of iron and steel scrap in making every *two* tons of open-hearth steel.

But normal sources of iron and steel scrap can't keep up with demand. That's why the steel industry asks you to collect your scrap—in the form of obsolete, worn-out machinery and parts—and send it back to the mill.

Only with *your* help can current military and civilian production demands be met.

Start *your* scrap salvage program today—call in your local scrap dealer *now*.

NON-FERROUS SCRAP IS NEEDED, TOO!



Courtesy of Excavating Engineer

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date — 15th of preceding month. Example: January closes December 15th.

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MARION 111-M long range stripping shovel. 3 cu. yd. dipper — 43'-0" boom. GM Twin 6-71 Diesel power with Ward-Leonard electric swing. In excellent condition, being sold as a result of a changing operation. Located Eastern Ohio. Available immediately.

Marion Power Shovel Company
Marion, Ohio

Marion 5480 shovel. Located in middle west. Inquire Box No. 3469, c/o EXCAVATING ENGINEER.

Bucyrus-Erie 750-B. Good operating condition. East central location; inquire Box 3460 c/o EXCAVATING ENGINEER.

FOR SALE

750-B BUCYRUS-ERIE 16 cu. yd. electric shovel, full Ward-Leonard.

This machine will become available in September, 1951. Good stock of spare parts. Located in Middlewest. Inquiry Box No. 3438, c/o EXCAVATING ENGINEER.

Lima 1201 — 3½ yard diesel shovel including spare dipper and handle. Three years old, good operating condition. Located Northern Minnesota. Box 3458

Bucyrus-Erie Model 5-W diesel dragline.
Bucyrus-Erie Model 9-W diesel dragline.
Bucyrus-Erie 120-B Ward-Leonard electric shovel.
Bucyrus-Erie 44-B diesel shovel and dragline.
Western location. Box 3463

Model K-45 Link-Belt combination shovel, clamshell and dragline powered with Caterpillar D-13000 diesel engine, equipped with 23' boom, 16' handle, 1½ cubic yard Amsco dipper and 50' box type clamshell boom. Shop No. 1997. Machine new, January 1940 and in good operating condition today. Box 3470

Bucyrus-Erie 20-B backhoe with Cummins HB 400 diesel engine. Priced for quick sale.

Morris G. Laramie & Son, Inc.
16200 West Eight Mile Rd.
KEnwood 1-9322 Detroit 35, Michigan

Bucyrus-Erie 34-B dragline 1¼ yard, Cat diesel, 50 foot boom. $13,500. A really good clean machine.

Edgar Plastic Kaolin Company
Edgar, Florida Phone Hawthorn 2992

P&H Model 750 dragline and clamshell, serial 4497, 60' boom, 1¾ cu. yd. dragline bucket, oversize cats. Good operating condition. Available immediately.

Pipe Creek Stone Company
Phone 954 Marion, Indiana

We Specialize
On Exclusively Used

mechanically sound, late model diesel Bucyrus-Erie and Northwest shovels, cranes, draglines and pullshovels. Our list of Bucyrus-Erie 15-B's, 22-B's, 38-B's and 54-B's and Northwest 25's, 6's, 80-D's and 95 machines are a most complete and comprehensive inventory of used machines of these models available. We also list walking draglines and all attachments.

J. C. French Company
226 Berry Parkway Park Ridge, Illinois
Tel. TAcott 5-4927

P&H Model 255-A, new 1948 ¾-yd dragline, Waukesha gas motor with 45 ft. boom including ¾-yd. Page dragline bucket, 26 inch treads, serial Number 12876; in good condition. Box 3465

Insley Model K-12 new 1947 with Chrysler gas engine, 50 ft. boom, 15 ft. jib, ¼-yd. combination dragline lifting crane and backhoe, machine in good condition. Box 3466

Used Bucyrus-Erie Model 51-B two-cubic yard shovel; standard equipped; 30" threads; Caterpillar D-17,000 power; current model, new 1947; located Denver, Colorado. Box 3462

Bucyrus-Erie 10-B dragline w/bucket No. 17899 Buda gas engine overhauled 1950; includes backhoe attachment 3 years old. Total price $7500 cash. Also 1944 KB-7 dump truck and home-made heavy low trailer for sale at $1000. Will sell 10-B complete w/truck and trailer for $8000.

Mrs. R. C. Henderson, 135-6th Ave., Marion, Ia.

P&H Model 600 shovel and backhoe combination with gasoline engine. Capacity 1¼ cu. yd. Available for rent or sale. SALE PRICE FOB LOUISVILLE, KY. $8500.

Brandeis Machinery & Supply Co. Inc.
Brook and Warnock Sts. Louisville 8, Ky.

Bucyrus-Erie Model 15-B combination shovel backhoe. 23000 series serial number. Machine now working and represented in good condition.

D. D. Kennedy, Inc.
P. O. Box 278 Bellwood, Illinois
Phone Chicago—Estebrook 8-5223

FOR SALE, LOCATED EASTERN N. Y.
D4 Cat. bulldozer, 10-B Bucyrus-Erie w/shovel, backhoe, crane w/trailer and truck. Excellent condition. All or part, reasonable. Box 3467

FOR SALE

Used dragline attachment complete for late Model 120-B Bucyrus-Erie machine consisting of 110' of boom, auxiliary gantry, fairlead, 4-yard dragline bucket, cables, etc. All in good condition.

Used Model 29-T Bucyrus-Erie well drill complete with 9" stem and bit and Caterpillar Model 4400 diesel engine. All in good condition. Location Hazleton, Pennsylvania.

Contact George P. Greene,
Conyngham, Pennsylvania

Buda HBL deep hole earth augering machine. Purchased in 1950 and used 150 days on U. S. Government job. Unit mounted on a 1½-ton 1941 Mack truck and capable of drilling 14" hole—40 ft. deep; 9" hole—90 ft. deep; 6" hole—150 ft. deep. Complete with 40 ft. of 14" flights and 100 ft. of 6" flights and all necessary operating tools. Unit in A-1 condition. Attractive price. Contact

Diehl Pump & Supply Company
866 Fehr Avenue
Louisville, Kentucky

Bucyrus-Erie 22-B shovel attachment, new, unused; contact D. D. Kennedy, Inc., P. O. Box 278, Bellwood, Illinois, or phone Hillside 2820.

Cedar Rapids crushing plant; 10x36 jaw, 24x16 rolls, sand rejector air brakes, 24'x24' delivery conveyor, ME-46 Murphy diesel power unit. Like new. Box 3468

Bucyrus-Erie 15-B, ½ yd., with UD-9 diesel engine. Attachments include backhoe, shovel, crane and clamshell.
International TD-14 Bucyrus-Erie bulldozer.
International TD-9 Bucyrus-Erie loader.
Allis-Chalmers HD-5 loader.
Caterpillar D-4 bulldozer.
All machinery less than two years old.

The J. & V. Rack Company
5033 North Bend Road Cincinnati 11, Ohio
Tele. Mo. 2654

FOR SALE OR RENT
Caterpillar grader, Model 112.
International TD-24 tractor.
International TD-14A tractor equipped with hydraulic angle dozer.
Caterpillar D-4 equipped with angle dozer and Hyster winch.
Air compressor, Ingersoll-Rand 105 diesel.
Sheepsfoot Roller, double drum.
All equipment in good condition.

L. M. Hart Construction Co., Inc.
219 Bell Court West Lexington, Kentucky

Continued on page 72

For Sale

Continued from page 71

McCarthy horizontal highwall drill.
McCarthy vertical highwall drill.
Lincoln welder on mount (with attachments).
2 Bulldozers.
2 LeTourneau Tournapulls.
Frank W. Albert
P. O. Box 291
Phillipsburg, Pa. Phillipsburg 1681

Bucyrus-Erie 22-B new shovel front, ¾ cu. yd. cast front dipper.
The Bode-Finn Company
2650 Spring Grove Avenue Cincinnati, Ohio
Phone MUlberry 2200

POSITIONS WANTED

Position wanted as shovel, dragline, clamshell or pile driver operator. Have operated gas, steam and diesel large and small machines. Prefer steady work. P. O. Box 8, Hurricane, West Virginia. Phone 2224-Hurricane.

Looking for a job as master mechanic or traveling mechanic. Will also take a job as shovel crane or dragline operator—must be steady job. Do not care too much to go outside of the USA. Can rebuild any and all machines. Can also run concrete mixers. 40 years experience. Box 3459

General superintendent or superintendent available; 30 years experience and qualifications; supervising, estimating, and building all types highways, airports, heavy excavating, large sewers, earth-filled dams, levies, covering several states. Honest, sober, and reliable, know cost and equipment. Interpret plans and organizing. Box 3464

If you are Buying or Selling Used Equipment this is the place to let the Excavating Industry know about it.

countries. He has been a member of the B-G management board since its inception in 1948, and has made theoretical sales potential studies which form the basis for the company's sales operations.

Caterpillar Tractor Co., Peoria 8, Ill., is now rebuilding track link assemblies by the use of an automatic welding process. This has enabled the company through its dealer outlets, to improve its parts conservation program. In recent years widespread use has been made of the submerged arc process for welding various sizes and shapes of materials. More recently, the same process has been extended to include the applications of weld metal surface overlays. This was true in the recent adaptation of an automatic welding machine to the resurfacing of tractor rollers and idlers. Less than six months ago Caterpillar dealers began operating their own submerged arc welding machines for this purpose. Because of the speed with which overlays of weld may be applied, efforts have been extended toward adapting the process to resurfacing of track links. Initial work accomplished a few months ago indicated the process to be entirely possible providing some means could be devised to correctly space the welds on assembled links. This problem has now been met successfully. This has led to the development of a completely automatic machine for resurfacing worn track links by the submerged arc process.

Mackintosh-Hemphill Co., Pittsburgh, Pa., manufacturers of rolls and machinery for the iron and steel industry, has entered a new field of manufacture and is currently marketing a line of forged steel disposable bits throughout the heavy construction industry. The company's new Drill Bit and Tool Division is charged with the research, development and manufacture of the new line. These bits are being manufactured in a new building adjacent to the company's Midland Plant at Midland, Pa. The sale of the "DBT Throwaway" rock bits through contractor and mine supply houses is the responsibility of Drill Bit and Tool Co. This is a newly-organized Delaware corporation and is a wholly owned subsidiary of Mackintosh-Hemphill Co. The new bits are manufactured and distributed under a license agreement. Drill Bit and Tool Co. will sell the new product throughout the United States and South America. The bit, as its name implies, is a one-pass bit, made so inexpensively that it can be thrown away when worn out, instead of being resharpened. Bits are made in a size range from 1¼ inches to 2⅜ inches. The new factory at Midland has been equipped with forging and high frequency induction heat treating equipment, plus facilities for the manufacture of forging dies and other wearing parts. This building also houses new machinery for the production of a supplemental line of hollow steel drill rods. When production gets fully underway, the Midland manufacturing plant will produce about 8 million units annually.

United States Rubber Co., NYC 20, N. Y., has appointed H. Barden Allison as district sales manager of the Philadelphia branch, mechanical goods division. A native of Philadelphia, Allison attended the Wharton School of Commerce and Finance and University of Pennsylvania. He joined U. S. Rubber in 1918 as a clerk in the mechanical goods branch in Philadelphia. He has held several important selling posts during his 23 years of service with the company. From 1933 until 1947, he was district sales manager in Cincinnati, O. In 1947 he became sales manager of the L. H. Gilmer division of the company, the position he held until his present appointment.

STEP UP DRILLING PRODUCTION WITH THIS "HAPPY COMBINATION"

IF you want increased production in blast hole drilling operations, use a Bucyrus-Erie one-piece combination stem and swivel socket in your rig's tool string. A large diameter section with no joints, this tool speeds up drilling by eliminating vibration or whipping of the stem in the drill hole. One less joint means easier maintenance, greater convenience too. Write today for complete information on this and other Bucyrus-Erie drilling and fishing tools.

BUCYRUS ERIE
SOUTH MILWAUKEE, WIS. 18A51

"All I know is that he said something about a date for tonight."

TWO TS 300 MOTOR SCRAPERS MOVE 247,000 YARDS in ten weeks!

You can get production like this with LaPlant-Choate MOTOR SCRAPERS

HERE are a few of the reasons why you can be sure of big-production profits when LPC Motor Scrapers are on the job:

- Big capacity . . . 14-yds. struck and 18-yds. heaped . . . to haul bigger pay loads.
- Over 22 mph for speed on the haul road.
- Your choice of a 280 HP Buda or a 275 HP Cummins diesel for fast acceleration and extra power when you need it.
- Easy loading characteristics that cut valuable seconds off your cycle time.
- Big interchangeable tires for extra traction and flotation.
- Extra high apron lift and positive forced ejection for faster, smoother spreading.

Your LaPlant-Choate distributor can show you other Motor Scraper features that keep you ahead of schedule with lower over-all costs. See him before you bid on your next job.

That's the record of

CONCRETE MATERIALS & CONSTRUCTION COMPANY'S

two LaPlant-Choate Motor Scrapers on a stripping job near Cedar Rapids, Iowa.

The normal work week of the two TS 300s was 20 hours a day per unit, 6 days a week. Material moved consisted of sandy clay. Hauls started at 500 ft. and gradually lengthened to 1000 ft. as the job progressed. Grades varied, running as high as 30% at the start of the job.

No wonder Concrete Materials is sold on Motor Scraper performance. They originally bought two TS 300s in September of 1947, worked each unit 18,000 hours on the toughest kind of jobs, and were so well satisfied with the performance records they traded the original units for two new TS 300 Motor Scrapers.

Since February of 1951 when these new rigs went into service, they have worked a total of 6200 hours, with only 430 hours of downtime. *That's 93% efficient*, another reason why there are so many repeat orders for LaPlant-Choate Motor Scrapers.

LAPLANT-CHOATE

MANUFACTURING CO., INC. ® CEDAR RAPIDS, IOWA, U. S. A.

Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.

2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.

Hydraulic and Cable-operated Dozers.

Dig and dump . . . speed the cycle . . . take those shocks . . . *stay on the job*—that's the big order you give a hoist rope. To have it filled, put *Preformed* Yellow Strand Hoist Rope on your power shovel. Specify Lang Lay with Independent Wire Rope Core—6 x 19 for ropes up to and including 1″ in diameter, 6 x 41 for sizes 1⅛″ and larger.

In *Preformed* Yellow Strand, whatever the construction, internal stresses have been relaxed. You gain with longer rope life, fewer shutdowns for replacement, more production for your rope dollar. Call your B & B distributor now so you'll have a real *working* rope on hand when it's time to change your hoist, drag, scraper or other heavy-duty line.

Broderick & Bascom Rope Co., St. Louis 15, Mo.

Branches: New York, Chicago, Houston, Los Angeles, San Francisco, Portland, Seattle *Factories:* St. Louis, Peoria, Houston, Seattle

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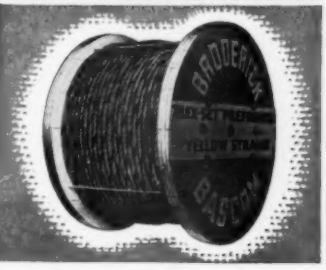
Yellow Strand

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